

Table 6.2  
 Water Surface Profiles

STA5 Flow-way 4A

Design Scenario	Initial Configuration		Initial SPF w/o Initial SPF		Buildout Configuration		Buildout SPF w/o Miami Flood		Buildout SPF w/ Miami Flood	
	Design	Miami Flood	Design	Flood	Design	Flood	Design	Flood	Design	Flood
Cell Flow (cfs)	N/A	N/A	N/A	N/A	390	665	390	665	781	781
Canal Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	17.7	18.7	17.7	18.7	19.1	19.1
Cell Inlet-Side Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	17.5	18.1	17.5	18.1	18.2	18.2
Cell Outlet-Side Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	16.0	16.6	16.0	16.6	16.7	16.7
Downstream Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	15.9	16.5	15.9	16.5	16.6	16.6

Table 6.2  
 Water Surface Profiles

STA5 Flow-way 4B

Design Scenario	Initial Configuration Design	Initial SPF w/o Miami Flood	Initial SPF w/ Miami Flood	Buildout Configuration Design	Buildout SPF w/o Miami Flood	Buildout SPF w/ Miami Flood
Cell Flow (cfs)	N/A	N/A	N/A	390	665	781
Upstream Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	16.0	16.6	16.7
Cell Inlet-Side Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	15.9	16.5	16.6
Cell Outlet-Side Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	14.0	14.0	14.0
Canal Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	12.5	12.7	13.4

Table 6.2  
 Water Surface Profiles

STA5 Flow-way 5A

Design Scenario	Initial Configuration Design	Initial SPF w/o Miami Flood		Buildout Configuration Design		Buildout SPF w/o Miami Flood		Buildout SPF w/ Miami Flood	
		Design	Flood	Design	Flood	Design	Flood	Design	Flood
Cell Flow (cfs)	N/A	N/A	N/A	N/A	N/A	490	835	981	
Canal Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	17.2	18.1			18.6	
Cell Inlet-Side Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	17.0	17.6			17.8	
Cell Outlet-Side Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	15.7	16.4			16.6	
Downstream Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	15.6	16.2			16.4	

Table 6.2  
Water Surface Profiles

STA5 Flow-way 5B

Design Scenario	Initial Configuration Design	Initial SPF Miami Flood	Initial SPF w/o Miami Flood	Initial SPF w/ Miami Flood	Buildout Configuration Design	Buildout SPF w/o Miami Flood	Buildout SPF w/ Miami Flood
Cell Flow (cfs)	N/A	N/A	N/A	N/A	490	835	981
Upstream Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	15.7	16.4	16.6
Cell Inlet-Side Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	15.6	16.2	16.4
Cell Outlet-Side Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	14.5	14.5	14.5
Canal Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	12.4	12.6	13.4

Table 6.2  
 Water Surface Profiles

STA6 Section 2

Design Scenario	Initial Configuration Design	Initial SPF w/o Miami Flood	Initial SPF w/ Miami Flood	Buildout Configuration Design	Buildout SPF w/o Miami Flood	Buildout SPF w/ Miami Flood
Cell Flow (cfs)	667	1060	700	355	605	712
Required Inlet Canal Water Surface Elevation (ft, NGVD)	15.8	17.1	17.4	15.1	15.6	15.8
Cell Inlet-Side Water Surface Elevation (ft, NGVD)	15.7	16.5	17.1	15.1	15.5	15.7
Cell Outlet-Side Water Surface Elevation (ft, NGVD)	15.1	16.2	16.9	14.0	14.0	14.0
Outlet Canal Water Surface Elevation (ft, NGVD)	14.9	15.7	16.7	12.4	12.5	13.1

Table 6.2  
Water Surface Profiles

STA6 Flow-way 3

Design Scenario	Initial Configuration Design	Initial SPF w/o Miami Flood	Initial SPF w/ Miami Flood	Buildout Configuration Design	Buildout SPF w/o Miami Flood	Buildout SPF w/ Miami Flood
Cell Flow (cfs)	105	168	111	46	78	92
Required Inlet Canal Water Surface Elevation (ft, NGVD)	15.5	16.2	17.0	14.7	15.1	15.2
Cell Inlet-Side Water Surface Elevation (ft, NGVD)	15.4	16.0	16.9	14.6	15.0	15.1
Cell Outlet-Side Water Surface Elevation (ft, NGVD)	15.0	15.7	16.8	14.1	14.2	14.3
Outlet Canal Water Surface Elevation (ft, NGVD)	14.9	15.6	16.7	12.1	12.1	12.2

Table 6.2  
 Water Surface Profiles

STA6 Flow-way 4

Design Scenario	Initial Configuration Design	Initial SPF w/o Miami Flood		Initial SPF w/ Miami Flood		Buildout Configuration Design	Buildout SPF w/o Miami Flood		Buildout SPF w/ Miami Flood	
		Design	Initial SPF w/o Miami Flood	Initial SPF w/ Miami Flood	Initial SPF w/ Miami Flood		Buildout Configuration Design	Buildout SPF w/o Miami Flood	Buildout SPF w/ Miami Flood	Buildout SPF w/ Miami Flood
Cell Flow (cfs)	N/A	N/A	N/A	N/A	N/A	355	605	712		
Canal Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	N/A	16.8	17.4	17.7		
Cell Inlet-Side Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	N/A	16.6	17.1	17.3		
Cell Outlet-Side Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	N/A	15.1	15.1	16.1		
Downstream Water Surface Elevation (ft, NGVD)	N/A	N/A	N/A	N/A	N/A	15.0	15.0	15.8		

Table 6.2  
Water Surface Profiles

STA6 Flow-way 5

Design Scenario	Initial Configuration Design	Initial SPF w/o Miami Flood		Buildout Configuration Design		Buildout SPF w/o Miami Flood		Buildout SPF w/ Miami Flood	
		Design	Initial SPF w/o Miami Flood	Initial SPF w/ Miami Flood	Buildout Configuration Design	Buildout SPF w/o Miami Flood	Buildout SPF w/ Miami Flood	Buildout SPF w/ Miami Flood	Buildout SPF w/ Miami Flood
Cell Flow (cfs)	286		454	301	124	209	246		
Required Inlet Canal Water Surface Elevation (ft, NGVD)	16.4		17.5	17.4	15.4	15.9	16.2		
Cell Inlet-Side Water Surface Elevation (ft, NGVD)	16.2		17.1	17.2	15.3	15.8	16.0		
Cell Outlet-Side Water Surface Elevation (ft, NGVD)	15.1		16.2	16.9	14.4	14.6	14.7		
Outlet Canal Water Surface Elevation (ft, NGVD)	14.9		15.7	16.7	12.1	12.1	12.2		

### **6.3 Two-Dimensional Modeling Results**

The FESWMS computed surface elevations and flow patterns are shown for the first scenario for each model in Figures 27 through 44. The flow patterns indicate that the feeder and collection ditches function well in spreading the flow evenly across the STAs. The borrow pits show only a local perturbation to the flow patterns. The results for STA-5 Flow-way 3A indicate that the southwest portion of the STA will be dry for some of the design conditions. Also, the results indicate that portions of the STA-5 Flow-way 4A and STA-5 Flow-way 4B may be dry under some flow conditions. However, the feeder canal directs the flow to the lower lying areas with sufficient capacity to prevent large heads from occurring near the flow inlet areas.

The WSE were extracted from each simulation in the vicinity of the flow inlet boundaries and used as input in subsequent flow analysis of the canal system to the west and north of the STAs. The extracted WSEs and resulting water surface profile for each treatment cell are shown in Table 6.2.

### **6.4 Combined Modeling Results**

The results of the 1-D, 2-D, and control structure modeling were used to develop the water surface profiles for the proposed treatment system. The WSE in the outlet canal for each flow condition was used to calculate the resulting water surface elevations in the cells. Head losses through control structures were calculated based on fully-open operation of the structures. Table 6.2 shows the calculated water surface profiles for the treatment cells planned for the Initial Configuration. The resulting WSE conditions in these cells under the Build Out Configuration are also provided in the table.

The modeling results indicate that the WSE in the L-3 canal may have to be as high as 19.1' NGVD to deliver the rated flowrates through all the flow-ways under all conditions. The G-407A diversion structure will impound the L-3 flow and direct it to the flow-ways.

The results shown in Table 6.2 indicate that the Base Scenario will be able to operate under the Design and SPF conditions. The calculated WSEs in the L-3 Canal will not affect the pump operation from the C-139 Annex reservoir. The C-139 Annex reservoir reportedly has an outlet weir crest elevation of about 17 feet NGVD. Since the L-3 Canal WSEs may be less than 17 feet NGVD under some conditions, the Alternate Scenario employing both gravity and pumped discharge may be usable if USSC maintains the reservoir at its Design WSE of 15.5 feet NGVD. It is apparent from these results that the Alternate Scenario could be useful when flows are significantly less than the Design flow and gravity discharge from the C-139 Annex reservoir is possible. Analysis of when the flow condition is low enough to allow the mixed discharge from the C-139 Annex reservoir was outside the original project scope. USSC may prefer to maintain the reservoir WSE at relatively low levels (11 feet NGVD). In this case, pumping will be the only discharge alternative.

#### **6.4.1 Base Case Scenario**

The results shown in Table 6.2 indicate that the Base Scenario will be able to operate under the Design and SPF conditions. The modeling indicates that the WSE in the L-3 Canal near the STA-6 cells will range from about 15 to 19 feet NGVD. The calculated WSEs in the L-3 Canal will not affect the pump operation from the C-139 Annex reservoir.

#### **6.4.2 Alternate Mixed Discharge Scenario**

The C-139 Annex reservoir reportedly has overflow weirs with crest elevations of 17 feet NGVD or more. Since the L-3 Canal WSEs can be less than 17 feet under some conditions, the Alternate Scenario employing both gravity and pumped discharge will be usable. For the Design and SPF conditions, a pumped discharge will be required to transfer the C-139 Annex flow to the STA-6 treatment system. A gravity discharge may be used when C-139 Basin flows are significantly less than the Design flow allowing the L-3 Canal stage to drop well below 17 feet NGVD. Under this condition, gravity flow from the reservoir will be possible.

The District has requested the evaluation of twin control structures to regulate gravity flow from the reservoir. Since WSEs in the L-3 Canal will vary, Table 6.3 lists control structure sizes with their accompanying headloss while delivering 452 cfs. Gated box culvert structures similar to the existing STA-5 structures were assumed.

**Table 6.3 C-139 Annex Gravity Structure Headloss at 452 cfs**

<b>Structure Size</b>	<b>Headloss (feet)</b>	<b>Maximum L-3 Canal WSE (ft, NGVD)</b>
(2) 8' by 6' Box Culverts	0.44	16.56
(2) 10' by 6' Box Culverts	0.28	16.72
(2) 10' by 8' Box Culverts	0.16	16.84
(2) 10' by 10' Box Culverts	0.10	16.90

The maximum L-3 Canal WSE assumes the WSE in the reservoir is at the design elevation of 17 feet NGVD. The selection of a structure size is dependent on the likely WSEs in the L-3 Canal under typical operating conditions. A review of the report, *Supplemental Analysis of L-3 Borrow Canal Stormwater Treatment Area No. 5* (Burns and McDonnell, March 1999) indicates that the L-3 Canal stage is below 17 feet NGVD 99 percent of the time prior to the STA-5 construction. The STA-5 operation and buildout will likely further reduce the frequency of elevated WSE in the L-3 Canal. It appears that twin 8' by 6' gated box culverts are appropriate for gravity drainage from the C-139 Annex reservoir.

## 6.5 Water Quality Results

The DMSTA modeling used the historic flow and phosphorus loading record from each tributary basin to estimate the typical phosphorus reduction that could be expected from the proposed treatment cells. The results of the modeling are shown in Table 6.4. Summary output of the modeling is provided in Appendix E.

The DMSTA modeling resulted in a predicted outflow phosphorus concentration of about 12 to 15 ppb (geometric mean) for the Initial Configuration of the STA-5 and STA-6 systems when evaluating the undivided cells STA-6 cells. The predicted outflow phosphorus concentration is 11 to 15 ppb (geometric mean) for the Build Out Configurations of the systems when the STA-6 cells are undivided.

A comparison of the model results for STA-6 with divided and undivided cells shows a predicted improvement in phosphorus load reduction of about 2 ppb when the STA-6, Section 2 and STA-6, Cell 5 cells are divided. An additional analysis was conducted to assess the difference in predicted load reduction when only Cell 5 of STA-6 was modeled as divided. The analysis shows a predicted phosphorus reduction of about 1 ppb when only Cell 5 was divided. Given the cost and time associated with constructing these dividing levees, the minimal improvement in phosphorus reduction does not appear justifiable.

**Table 6.4 Summary of Phosphorus Reduction Projections**

STA Configuration	Estimated Average Annual Discharge		Estimated Total Phosphorus Concentrations	
	Treated Outflow (ac-ft/yr)	Outflow Phosphorus Loading (kg/yr)	Flow-weighted Mean (ppb)	Geometric Mean (ppb)
<b>STA-5 Initial Configuration</b>	126,876	2,286 to 3,227	20 to 29	12 to 15
<b>STA-6 Initial Configuration w/ divided 6-2 and 6-5 cells</b>	40,211	656 to 844	19 to 25	12 to 15
<b>STA-6 Initial Configuration w/ undivided cells</b>	40,211	760 to 908	20 to 25	17 to 19

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STA Configuration	Estimated Average Annual Discharge		Estimated Total Phosphorus Concentrations	
	Treated Outflow (ac-ft/yr)	Outflow Phosphorus Loading (kg/yr)	Flow-weighted Mean (ppb)	Geometric Mean (ppb)
<b>STA-5 Build Out Configuration</b>	127,768	1,831 to 2,483	18 to 25	11 to 14
<b>STA-6 Build Out Configuration w/ divided 6-2 and 6-5 cells</b>	35,671	514 to 584	16 to 18	11 to 12
<b>STA-6 Build Out Configuration w/ undivided cells</b>	35,590	541 to 605	16 to 19	13 to 15

## **7.0 HYDRAULIC STRUCTURE RECOMMENDATIONS**

The following paragraphs provide recommendations for the hydraulic structures for use in the proposed treatment cells for the Initial Configuration.

### ***STA-6 Section 1, Cell 3 Inflow Structure***

Peak flow through this structure was defined by the highest Design or SPF flow to the cell. Due to the treatment cell configuration, only one inlet structure will be required to meet the cell's flow requirements. The recommended throat dimension for this gated box culvert structure is 8-feet wide by 6-feet tall.

### ***STA-6 Section 1, Cell 5 Inflow Structures***

Peak flows through these structures were defined by the highest Design or SPF flow to the cell. Due to the treatment cell configuration, two inlet structures will be required to meet the cell's flow requirements. The recommended throat dimension for these gated box culvert structures is 8-feet wide by 6-feet tall.

### ***STA-6 Cell 4 Inflow Structures***

Peak flows through these structures were defined by the hydrologic modeling and were used to size the structures. Two structures have been recommended due to the width of the treatment cell. The recommended throat dimension for these gated box culvert structures is 10-feet wide by 8-feet tall.

### ***STA-6 Section 2 Inflow Structures***

Peak flows through these structures were defined by the hydrologic modeling and were used to size the structures. Three structures have been recommended due to the width of the treatment cell. The recommended throat dimension for these gated box culvert structures is 8-feet wide by 8-feet tall.

### ***STA-6 Section 2 Outflow Structures***

Peak flows through these structures were defined by the hydrologic modeling and were used to size the structures. Three structures have been recommended due to the width of the treatment cell. The recommended throat dimension for these gated box culvert structures is 10-feet wide by 10-feet tall.

### ***STA-5 Flow-ways 3 and 4 Inflow Structures***

The inflow structures used for the STA-5-Flow-way 1 and STA-5-Flow-way 2 treatment areas will be suitable for use in STA-5 Flow-ways 3 and 4. Peak flows through these structures were defined by the highest Design or SPF flow to the cell. The existing STA-5 treatment areas use two gated box culvert structures with throat dimensions of 10-feet wide by 6-feet tall.

***STA-5 Flow-ways 3 and 4 Intermediate Structures***

Peak flows through these structures were defined by the hydrologic modeling and were used to size the structures. Two structures have been recommended due to the width of the treatment cell. The recommended throat dimension for these gated box culvert structures is 10-feet wide by 8-feet tall.

***STA-5 Flow-ways 3 and 4 Outflow Structures***

Peak flows through these structures were defined by the hydrologic modeling and were used to size the structures. Two structures have been recommended due to the width of the treatment cell. The recommended throat dimension for these gated box culvert structures is 10-feet wide by 10-feet tall.

***STA-5 Flow-way 5 Inflow Structures***

Peak flows through these structures were defined by the highest Design or SPF flow to the cell. Two gated box culvert structures with throat dimensions of 10-feet wide by 8-feet tall are recommended.

***STA-5 Flow-way 5 Intermediate Structures***

Peak flows through these structures were defined by the hydrologic modeling and were used to size the structures. Three structures have been recommended due to the width of the treatment cell. The recommended throat dimension for these gated box culvert structures is 10-feet wide by 8-feet tall.

***STA-5 Flow-way 5 Outflow Structures***

Peak flows through these structures were defined by the hydrologic modeling and were used to size the structures. Three structures have been recommended due to the width of the treatment cell. The recommended throat dimension for these gated box culvert structures is 10-feet wide by 10-feet tall.

***G-407A Diversion Structure***

Peak flows through this structure were defined by the highest predicted by-pass flow. A structure similar to the Existing G-406 diversion structure was determined to be adequate to accommodate the by-pass flow. This will be a gated twin-box culvert structure with recommended throat dimensions of 10-feet wide by 9-feet tall.

***C-139 Annex Outflow Structures***

Peak flow through these structures are limited to 452 cfs by permit limitation. A structure similar to the existing G-406 diversion structure can accommodate the flow. This will be a gated twin-box culvert structure with recommended throat dimensions of 8-feet wide by 6-feet tall.

***G-406 Diversion Structure Modifications***

Bypass flows through the G-406 structure are anticipated to increase the flooding potential in the C-139 Basin. A modification to the structure will reduce the flooding potential to the current level. The crest elevation of the earthen dike across the L-3 Canal should be reduced to 20.5 feet NGVD. The length of this lowered section should be at

least 250 feet long. Armoring of the downstream bank of the dike should be incorporated to protect from dike erosion.

***C-139 Annex Pump Station***

The pump station for C-139 Annex discharges should have a rated capacity of at least 452 cfs when operating at a static head difference of 10 feet.

***STA-6 Discharge Pump Station***

The STA-6 discharge pump station should have a rated capacity of at least 2,812 cfs when operating against a static head difference of 6 feet.

## **8.0 ENGINEERING OPINION OF CAPITAL AND MAINTENANCE/OPERATION COSTS**

### **8.1 STA-6 Sections 1 and 2**

#### ***STA-6 Section 1 and 2 Revised Recommended Improvements and Enhancements***

The improvements and enhancements for STA-6 Sections 1 and 2 for this phase of the study include the following recommendations. Referenced enhancements were consistent with those identified with the November 2004 revision to the Long Term Plan as modified by the evaluation requirements of this work order. The improvements and cost estimates herein include both the original construction envisioned by the 2003 LTP, the enhancements proposed in the Revised November 2004 LTP as modified by the evaluations of the modeling assessments herein.

- Construction of approximately 4.4 miles of perimeter levee impounding STA-6 Section 2;
- Construction of six (6) total additional water control inflow structures through the new Section 2 west levee (3) and existing Section 1 levees (3). These structures are to be 8'x 8' gated RCBs for the Section 2 levee and 8'x 6' gated RCBs for Section 1 levees all fitted with remotely operated telemetric control;
- Construction of Three (3) additional water control outflow structures through the new Section 2 east levee. These structures are to be 10' x 8' gated RCBs with remotely operated telemetric control;
- Extension of an overhead power distribution line (Glades Electric) from the interior USSC canal, then looping around the north and east levees of Section 2 (est. total length of approximately 3.0 miles);
- Herbicide treatment of Section 2 for removal of exotic vegetation to permit development of Macrophyte and SAV (1440 Ac.);
- Construction of a new water supply pumping station (G-401) for irrigation of STA-6 Sections 1 & 2. That pumping station is assigned a preliminary capacity of 60 cfs, roughly equivalent to a supply rate of 0.30" per day over the entire surface area of STA-6 Sections 1 and 2;
- Construction of a new twin barreled water control structure G-407A in the L-3 Canal. This structure is to contain 2-10'x10' gated RCBs with remotely operated telemetric control.
- Removal of Structures G-607, G-88 and G-155 to facilitate flows to the L-4 and L-3 Extension Canals and demolition of the deteriorated Oil Well Bridge across the L-3 Canal.
- Construction of three (3) new access bridges across the STA-6 Discharge Canal, the L-4 Canal and to replace the deteriorated Oil Well Bridge across the L-3 Canal.
- Recreational facilities are proposed to provide public access to STA-6. The proposed facilities include a parking area, landscaping, pedestrian gates, signage

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and fencing as needed to define public access areas and to protect sensitive equipment.

## 8.2 STA-6 Section 1 and 2 -Engineering Opinion of Capital Cost

An opinion of the capital cost for implementing the recommended Section 2 expansion and Section 1 modifications to STA-6 including the proposed recreational facilities is presented in Table 8.1. That estimate is reported in FY 2005 dollars assuming a 3% escalation from 2004 dollars.

**Table 8.1 Revised Opinion of Capital Cost, STA-6 Sections 1 & 2**

Item No.	Description	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Total Cost	Remarks
	<b>STA-6 SECTIONS 1 &amp; 2</b>					
1	New Perimeter Levee and Discharge Canal Levees	5.9	Mi.	\$625,000	\$3,687,500	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase Including Blasting Costs
2	New Water Control Structures (3-8'x 6" and 3- 8'x 8', Gated)	3 3	Ea. Ea.	\$225,000 \$275,000	\$1,500,000	Unit Costs from current reported construction costs at STA 3/4
3	New Water Control Discharge Structures (10' x 8' Gated)	4	Ea.	\$325,000	\$1,300,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
4	Fill Farm Canals and Ditches	25.5	Mi.	\$35,000	\$892,900	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
5	Water Control Structure Electrical (Includes Telemetry)	10	Ea.	\$50,950	\$509,500	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
6	Stilling Wells (Includes Electrical and Telemetry)	7	Ea.	\$30,000	\$210,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
7	Electrical Power Distribution	3.0	Mi.	\$95,000	\$285,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
8	Water Supply Pumping Station	60	CFS	\$11,250	\$675,165	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
9	Eradication of Existing Vegetation	1440	AC	\$240	\$345,600	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 in
10	<b>New G-407A Structure</b> (Twin 10'x 9' Gated)	1	Ea.	\$750,000	\$750,000	Prorated increase in size from item 3.
11	Demolish Existing Structures (G-607, G-88, Oil Well Bridge)	3	Ea.	\$50,000	\$150,000	Order of Magnitude Estimate
12	Replace 3 Bridges (L-3,L-4 & Oil Well)	3	Ea.	\$750,000	\$2,225,000	Order of Magnitude Estimate
				<b>SUBTOTAL</b>	<b>\$12,887,135</b>	

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	<b>RECREATIONAL FACILITIES</b>					
10.1	5 Space Parking Lot	220	SY	\$21.09	\$4,641	FDOT Subgrade 6" lime rock Material and Grading/Shaping
10.2	Pedestrian Gates	3.00	Ea.	\$833	\$2,500	Fence Gate (Type B) Single 4' FDOT 0550-76-41
10.3	Protective Fencing	1.00	LS	\$10,300	\$10,300	Allowance
10.4	Signage	1.00	LS	\$5,150	\$5,150	Allowance
10.5	Landscaping	1.00	LS	\$10,300	\$10,300	Allowance
				Subtotal	\$32,891	
<b>Subtotal, Estimate Construction Costs</b>					<b>\$12,563,666</b>	
Planning, Engineering & Design					10%	\$ 1,256,366
Construction Management					7%	\$ 879,448
<b>Total Estimate Cost, Without Contingency</b>						<b>\$14,699,480</b>
Contingency					20%	2,939,896
<b>TOTAL ORDER OF MAGNITUDE ESTIMATED CAPITAL COST</b>						<b>\$17,639,376</b>

### 8.3 STA-6 Sections 1 and 2 -Engineering Opinion of Incremental Operation & Maintenance Cost

The following is a summary listing of the anticipated incremental operation and maintenance requirements for the recommended enhancement to STA-6 Section 1 and 2 including the recreational facilities (e.g., requirements in addition to those for operation and maintenance of STA-6 as presently constructed and planned):

- Maintenance of approximately 5.9 additional miles of perimeter/discharge canal levees;
- Operation and maintenance of the nine (9) additional water control structures through the new and existing levees;
- Operation and maintenance of the new water supply pumping station (G-401). The pumps are assumed to be driven by electric motors. The unit operating costs are estimated using a power cost of \$0.08/kw-hr; an assumed total head of 6 feet; an overall efficiency of 85%; and an assigned utilization equal to 10% of the overall time. The resultant power consumption is 0.43 kw/cfs, or 3,770 kw-hr/cfs/yr., yielding an approximate average annual cost of \$300/yr/cfs;
- Operation and maintenance of the new water control structure G-407A;
- Additional herbicide treatment of Cells 4 and 5B for control of invasive species and emergent macrophyte vegetation. This item includes both:
  - Annual costs to spray for invasive species;
  - Additional costs for post-drought eradication of undesirable species.
- Operation and maintenance costs associated with the proposed recreational facilities.

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A revised opinion of the incremental operation and maintenance cost for the recommended enhancement of STA-6 including the proposed recreational facilities is presented in Table 8.2

**Table 8.2 Revised Opinion of Incremental O&M Cost, Enhanced STA-6**

Item No.	Description	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Total Cost	Remarks
1	New Perimeter/Discharge Canal Levees	5.9	Mi.	\$3,400	\$20,060	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
2	New Water Control Structures	9	Ea.	\$8,840	\$79,560	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
3	Mechanical Maintenance, Water Supply Pumping Station, Each Unit	1	Ea.	\$10,300	\$10,300	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
4	Power Consumption, Water Supply Pumping Station	60	CFS	\$309	\$18,540	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
5	Incremental Cost for Annual Vegetation Control	1440	AC	\$31	\$44,640	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
6	<b>Recreational Facilities</b>					
6.1	Routine Clean-up and Maintenance	12	Mos	\$2,000	\$24,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
6.2	Additional O&M for recreational Facilities				\$1,645	Estimated @ 5% construction cost
<b>Subtotal, Estimate on Incremental Operation &amp; Maintenance Costs</b>					<b>\$ 198,745</b>	
					Contingency @ 20%	\$ 39,749
<b>TOTAL ESTIMATED CAPITAL COST</b>						<b>\$238,494</b>

The estimated cost for operation, maintenance and monitoring of STA-6 as it is presently planned is discussed in Part 8 of the October 27, 2003 Long-Term Plan. The estimated monitoring costs in Part 8 of the October 27, 2003 Long-Term Plan include the additional costs for monitoring of the recommended enhancements.

#### **8.4 STA-5 Flow-way 3 Revised Recommended Expansion**

The following revisions are proposed to be included in the proposed expansion of STA-5 Flow-way 3;

- Construction of a third flow-way (one-mile wide immediately south of existing flow-way 2) on a 2,560-acre portion of Compartment C. Assuming the same topographic limitations as in the existing STA, approximately 2,055 acres could be developed as effective treatment area.
- Approximately 4 miles of south perimeter levee, 2 miles of Internal/Discharge Levee and 1 mile of a new discharge canal, and six (6) gated water control structures will comprise the major construction features for the expanded STA-5.

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- Two (2) new Cell-3A inlet control structures (similar to G-342A-D) could be constructed.
- Two (2) interior water control structures could be installed in a new levee that would separate the upstream cell (3A) from the downstream cell (3B). Cell-3A could be developed as an emergent marsh and Cell-3B could be developed as an SAV cell identical to Cell 1B and 2B,
- Two (2) new Cell-3B outlet control structures (similar to G-344A-D) could be constructed.
- A new discharge canal could convey treated water either north to the existing STA-5 discharge canal.
- In addition to the above recommendations, recreational facilities are proposed to provide public access to STA-5. The first phase of the proposed recreational facilities includes a parking area, a composting toilet and an information kiosk. Pedestrian gates, signage and fencing as needed to define public access areas and to protect sensitive equipment are also proposed. The second phase includes a viewing tower, landscaping and a picnic shelter.

### 8.5 STA-5 Flow-way 3 - Revised Engineering Opinion of Capital Cost

A revised opinion of the capital cost for implementing the revised recommended enhancement of STA-5 including the proposed expansion and the proposed recreational facilities is presented in Table 8.3. That estimate is reported in FY 2005 dollars assuming a 3% escalation in 2004 dollars. The revised estimate herein is based on data contained in the November 2004, Revision to the Long Term Plan as modified for the proposed designs evaluated for this study and escalated 3% to 2005 costs.

**Table 8.3 Revised Opinion of Capital Cost, STA-5 Flow-way 3**

Item No.	Description	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Total Cost	Remarks
1	3 <sup>rd</sup> Flow-way Addition: Eradication of Existing Vegetation	2550	AC	\$206	\$525,300	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
2	3 <sup>rd</sup> Flow-way Addition: Discharge Canal & Levee	1	Mi.	\$643,750	\$643,750	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
3	3 <sup>rd</sup> Flow-way Addition: South and East Perimeter Levee & Canal	5	Mi	\$579,375	\$2,896,875	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
4	3 <sup>rd</sup> Flow-way Addition: Degrading Farm Roads & Plug	25	Mi.	\$35,000	\$875,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
5	Infill Existing Seepage Canal	2	Mi.	\$75,000	150,000	Order of Magnitude Estimate

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6	3 <sup>rd</sup> Flow-way Addition: Clear & Grub	210	AC	\$515	\$108,150	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
7	3 <sup>rd</sup> Flow-way Addition: Demuck Perimeter Levee & Canal	250,000	CY	\$3.28	\$821,425	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
8	3 <sup>rd</sup> Flow-way Interior Levee	1	Mi.	\$401,700	\$401,700	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
9	3 <sup>rd</sup> Flow-way Addition: Inflow Structures 10' x 6'	2	EA	\$260,000	\$520,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
10	3 <sup>rd</sup> Flow-way Interior Structures 10' x 8'	2	EA	\$325,000	\$650,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
11	3 <sup>rd</sup> Flow-way Addition: Outflow Structures 10' x 10'	2	EA	\$375,000	\$550,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
12	3 <sup>rd</sup> Flow-way Addition: Power Distribution (Extend FPL Lines)	3.5	Mi.	\$95,000	\$332,500	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
13	Water Control Structure Electrical (Includes Telemetry)	6	Ea.	\$50,950	\$305,700	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
14		6	EA	\$20,600	\$123,600	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
15	3 <sup>rd</sup> Flow-way Addition: Stripping Muck Discharge Canal	80,000	CY	\$2.06	\$164,800	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
16	3 <sup>rd</sup> Flow-way Addition: Blasting	800,000	CY	\$1.69	\$1,352,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase. Order of Magnitude Estimate
17	G-406 Modifications	1	LS	\$250,000	\$250,000	Modify existing structure and L-3 canal plug
				<b>SUBTOTAL</b>	<b>\$10,670,800</b>	
17	<b>Recreational Facilities 1<sup>st</sup> Phase – 2006 Construction</b>					Added
17.1	<b>20 Space Parking Lot</b>	880.00	SY	\$20.48	\$18,022	FDOT Subgrade 6" lime rock Material and Grading/Shaping
17.2	<b>Information Kiosk 8' X 12'</b>	1.00	Ea.	\$10,000	\$10,000	Allowance Based on recent S-5A boat ramp project
17.3	<b>Pedestrian Gates</b>	3.00	Ea.	\$800	\$2,400	Fence Gate (type B) Single 4'

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						FDOT 0550-76-41
17.4	<b>Protective Fencing</b>	1.00	LS	\$10,000	\$10,000	Added
17.5	<b>Signage</b>	1.00	LS	\$5,000	\$5,000	Added
17.6	<b>Compost Toilet And Trash Cans</b>	1.00	Ea.	\$40,000	\$40,000	Based on Recent similar purchase
	<b>Recreational Facilities 2nd Phase 2007 Construction</b>					
19.7	Picnic Shelter 12' x 20'	1.00	Ea.	\$16,000	\$16,000	Based on Comfort Stations, prefab, stock, excel. Int. finish or electrical, max
19.8	<b>Viewing Tower 12' (H) 20' x 20' with ADA Boardwalk</b>	1.00	Ea.	\$30,000	\$30,000	
19.9	<b>Landscaping</b>	1.00	LS	\$10,000	\$10,000	
<b>Subtotal, Estimate Construction Costs</b>					<b>\$10,812,222</b>	
				Planning, Engineering & Design	10%	\$ 1,081,222
				Construction Management	7%	\$ 756,855
<b>Total Estimate Cost, Without Contingency</b>					<b>\$12,650,299</b>	
				Contingency	20%	\$ 2,530,060
<b>TOTAL ESTIMATED CAPITAL COST</b>					<b>\$15,180,359</b>	

### 8.6 STA-5 Flow-way 3 - Revised Opinion of Incremental Operation & Maintenance Cost

The following is a summary listing of the anticipated incremental operation and maintenance requirements for the recommended enhancements to STA-5 Flow-way 3 including the proposed recreational facilities (e.g., requirements in addition to those for operation and maintenance of STA-5 as it presently exists).

- Maintenance of exterior levees associated with new third flow-way;
- Operation and maintenance of the additional water control structures in new third flow-way;
- Additional herbicide treatment of new third flow-way for control of invasive species and emergent macrophyte vegetation. This item includes both:
  - Annual costs to spray for invasive species;
  - Additional costs for post-drought eradication of undesirable species.
- Additional herbicide treatment of Cell 2B for control of invasive species and emergent macrophyte vegetation. This item includes both:
  - Annual costs to spray for invasive species;
  - Additional costs for post-drought eradication of undesirable species.

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- Operation and maintenance costs associated with proposed recreational facilities.

A revised opinion of the average annual incremental operation and maintenance cost for the revised recommended enhancement of STA-5 including the proposed expansion and the proposed recreational facilities is presented in Table 8.4.

**Table 8.4 Revised Opinion of Incremental O&M Cost,  
Enhanced STA-5 Flow-way 3**

Item No.	Description	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Total Cost	Remarks
	<b>Flow-way 3 and other earthwork</b>					
1	Additional O&M for 3 <sup>rd</sup> flow-way				\$ 540,611	Estimated @ 5% construction cost
2	Incremental Cost for Annual Vegetation Control, SAV Cells	1220	AC.	\$31	\$37,820	
3	<b>Recreational Facilities</b>					
3.1	Additional O&M for recreational Facilities	1	Ea.		\$6,768	
3.2	Comp Toilet and Trash Collection	12	Mos	\$1,545	\$18,540	
3.3	Routine Clean-up and Maintenance	12	Mos	\$2,060	\$24,720	
<b>Subtotal, Estimate on Incremental Operation &amp; Maintenance Costs</b>						<b>\$ 628,459</b>
						Contingency @ 20% <b>\$ 125,692</b>
<b>TOTAL ESTIMATED OPERATION AND MAINTENANCE COST</b>						<b>\$754,151</b>

Costs associated with the additional monitoring of the new third flow-way are not included herein.

### **8.7 C-139 Annex -Engineering Opinion of Capital Cost**

The following Table 8.5 presents estimated cost of construction for various components associated with the construction of the C-139 Annex Pumping Station. Under the settlement agreement with USSC, the District is obligated to reimburse USSC for the design and construction of the 452 CFS Pumping Station only. Per Senario 2 of this work task, the option of utilizing gravity controlled discharge structures from the C-139 Annex was evaluated. The cost estimate below includes the cost of providing 2 gravity discharge structures but under the settlement agreement, the District is not obligated to pay for the structures but they can be constructed by USSC and utilized to discharge to the L-3 Canal under lower flow conditions as an operating cost savings relative to pump station operation. .

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Table 8.5 represents the base case where USSC only constructs the 452 cfs discharge pumping station with no gravity discharge structures included in the discharge structure to the L-3 Canal. Table 8.5A represents the alternative to the base case where USSC constructs two (2) gated culverts (8' X 6') to provide for gravity flow from the C-139 Annex reservoir. The difference between the two costs (\$456,582), is simply the cost of additional engineering design, physical construction and construction management with applied contingency for construction of the two additional gated gravity discharge structures. While the initial construction costs are higher, USSC will benefit from a long term O&M perspective as it will not have to run expensive pumps to discharge to the L-3 canal but will be able to gravity discharge to the L-3 canal at low flows elevations.

**Table 8.5 Opinion of Capital Cost, C-139 Annex Enhancements  
(Pumped Discharge Without Gravity Discharge Culverts)**

Item No.	Description	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Total Cost	Remarks
	<b>C-139 Annex Enhancements</b>					
1	New Discharge Pumping Station	452	CFS	\$8,250	\$3,729,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
2	Water Control Structure Electrical (Includes Telemetry)	3	Ea.	\$50,950	\$152,850	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
3	Stilling Wells (Includes Electrical and Telemetry)	3	Ea.	\$10,660	\$31,980	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
4	Electrical Power Distribution	2	Mi.	\$94,750	\$189,500	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
<b>Subtotal, Estimate Construction Costs</b>					<b>\$4,103,330</b>	
Planning, Engineering & Design					10%	\$ 410,333
Construction Management					7%	\$ 287,233
<b>Total Estimate Cost, Without Contingency</b>						<b>\$4,800,896</b>
Contingency					30%	\$1,440,269
<b>TOTAL ESTIMATED CAPITAL COST</b>						<b>\$6,241,165</b>

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**Table 8.5A Opinion of Capital Cost, C-139 Annex Enhancements**  
**(Pumped Discharge with some Gravity Discharge at low L-3 elevations)**

Item No.	Description	Estimated Quantity	Unit	Estimated Unit Cost	Estimated Total Cost	Remarks
	<b>C-139 Annex Enhancements</b>					
1	New Discharge Pumping Station	452	CFS	\$8,250	\$3,729,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
2	New Water Control Structures (8'x 6", Gated)	2	Ea.	\$150,000	\$300,000	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
3	Water Control Structure Electrical (Includes Telemetry)	3	Ea.	\$50,950	\$152,850	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
6	Stilling Wells (Includes Electrical and Telemetry)	3	Ea.	\$10,660	\$31,980	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
7	Electrical Power Distribution	2	Mi.	\$94,750	\$189,500	Unit Costs from Nov/ 04 Rev. to LTP. Adj. For 3% 2005 increase
<b>Subtotal, Estimate Construction Costs</b>						<b>\$4,403,330</b>
Planning, Engineering & Design					10%	\$ 440,333
Construction Management					7%	\$ 308,233
<b>Total Estimate Cost, Without Contingency</b>						<b>\$5,151,896</b>
Contingency					30%	\$1,545,569
<b>TOTAL ESTIMATED CAPITAL COST</b>						<b>\$6,697,747</b>

### 8.8 C-139 Annex -Engineering Opinion of Operation and Maintenance Cost

Under the settlement agreement with USSC, responsibility for Operation and Maintenance costs with regard to the C-139 Annex Pumping Station is not the responsibility of the District and is not estimated herein.

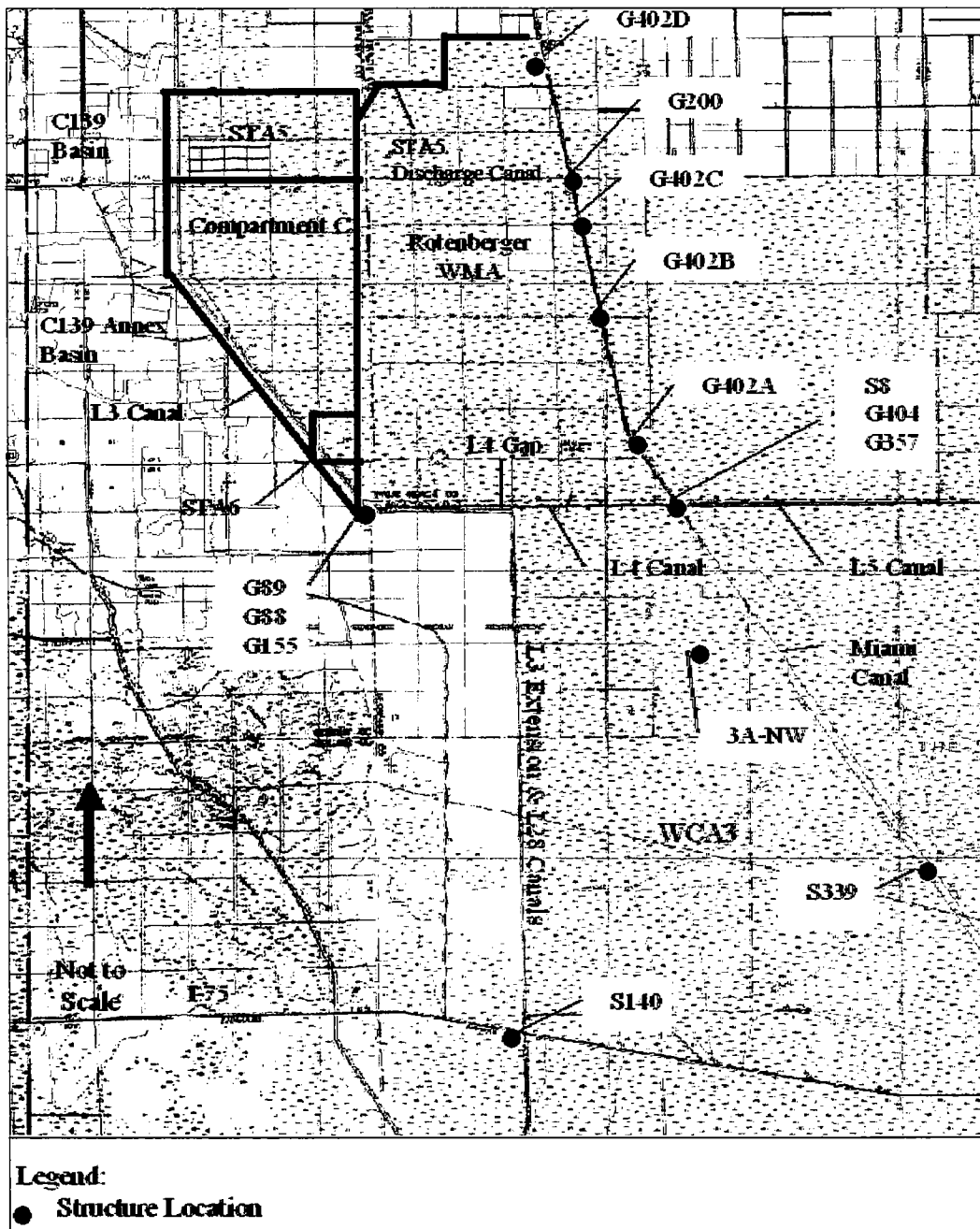
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**SFWMD**  
**STA 6,**  
**SECTION 2**

**URS**

7800 CONGRESS AVE., SUITE 200  
 BOCA RATON, FL, 33487  
 PHONE: 561.994.8500  
 FAX: 561.994.8524  
 CERT. OF AUTHORIZATION 1213

SCALE:  
 AS SHOWN

DRAWN BY: JC  
 CHECKED BY: CV

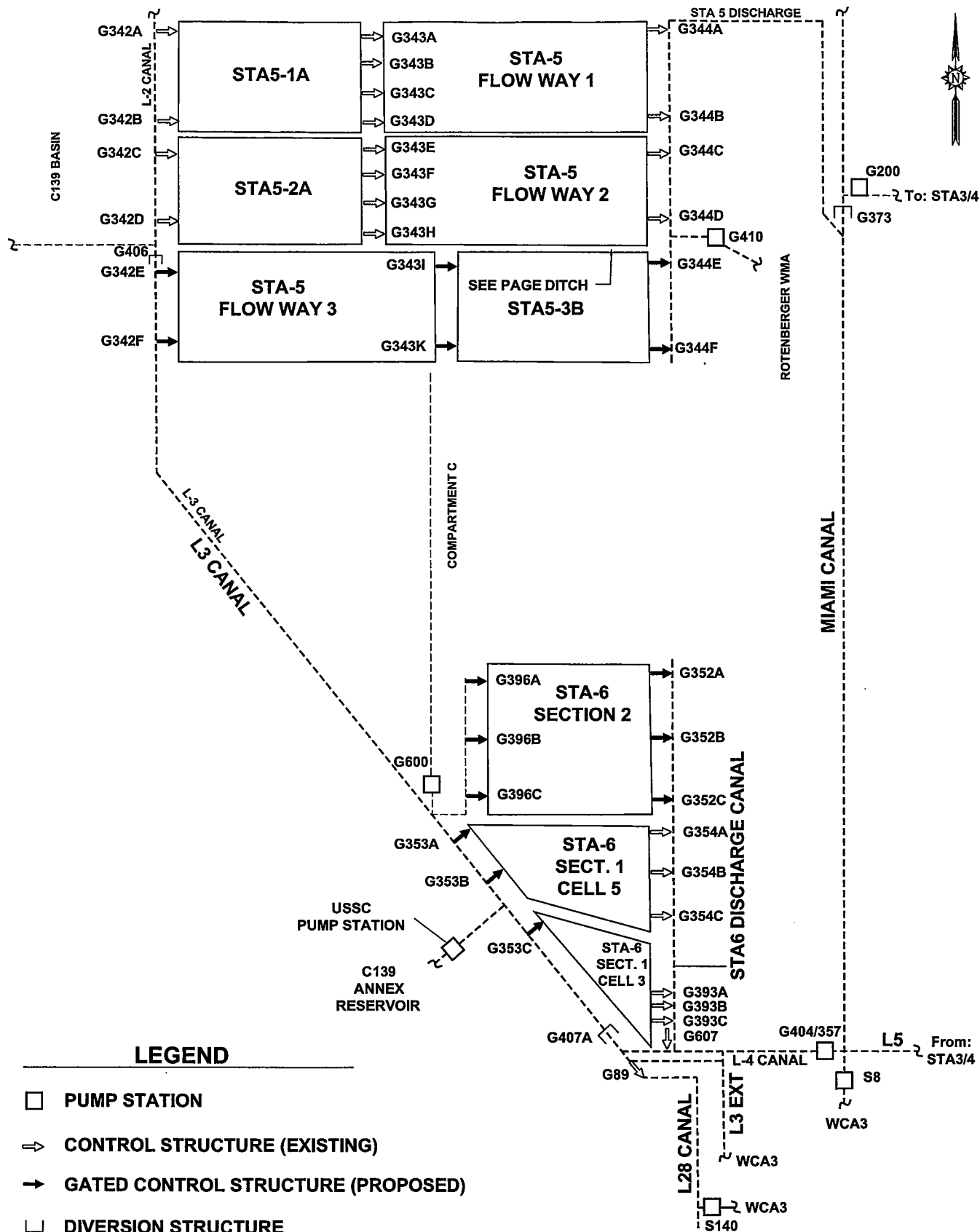
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**BUILDOUT CONFIGURATION**

PROJ NO  
 38615319

FIG NO  
**2**



**SFWMD  
COMPARTMENT C**

**URS**

Boca Raton, Florida

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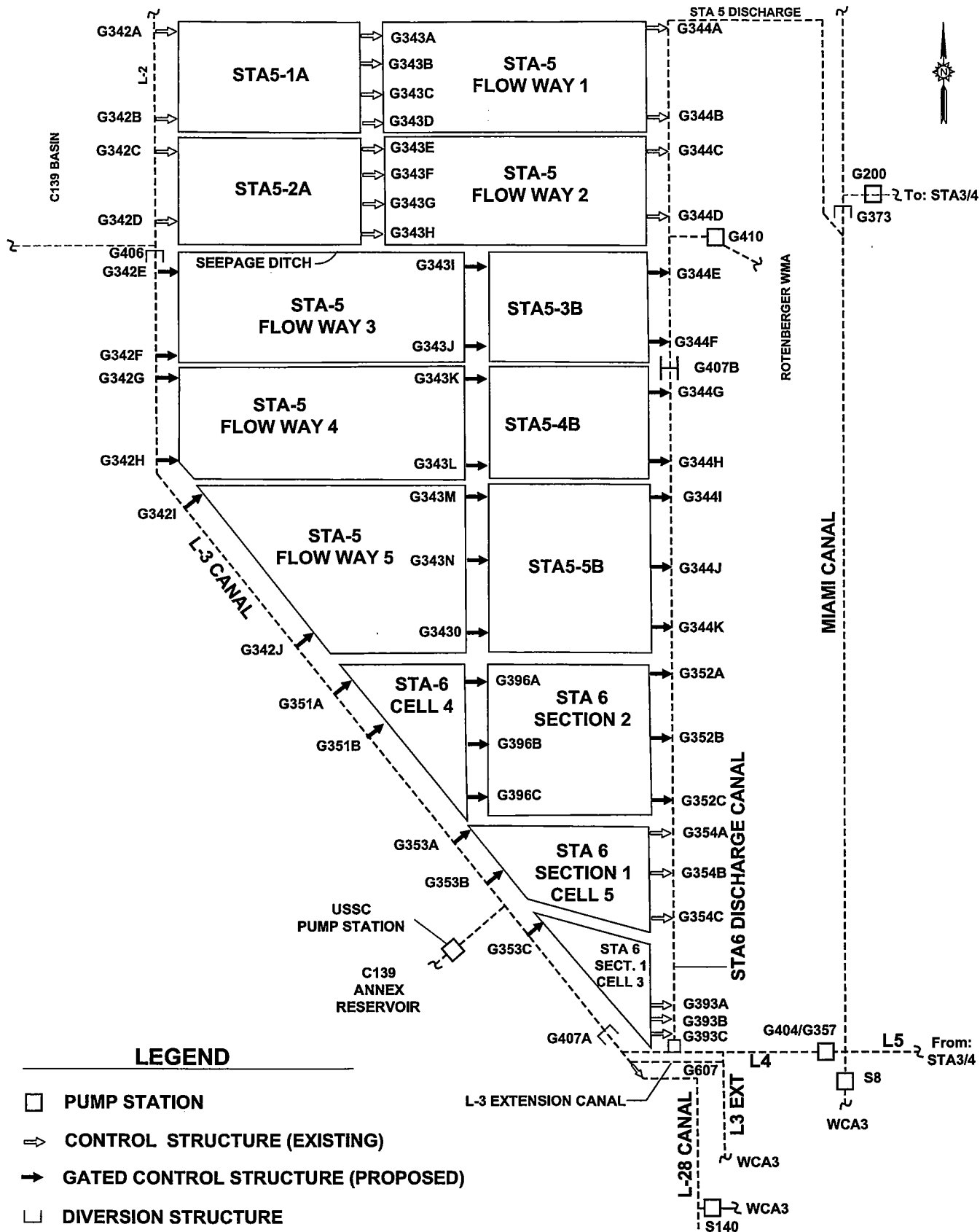
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**STRUCTURE SCHEMATIC  
CONFIGURATION  
INITIAL PHASE 1**

PROJ NO  
38615215

FIG NO  
**3**



**SFWMD  
COMPARTMENT C**

**URS**

Boca Raton, Florida

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**STRUCTURE SCHEMATIC  
BUILDOUT CONFIGURATION  
PHASE 2**

PROJ NO

38615215

FIG NO

4

C139 FLOWS  
SPF: 3440  
DESIGN:2096

L-2 CANAL

### STA5-1 FLOWS

NO FLOOD SPF:836  
FLOOD SPF: 360  
DESIGN: 596

### STA5-2 FLOWS

NO FLOOD SPF:836  
FLOOD SPF: 360  
DESIGN: 596

### STA5-3 FLOWS

NO FLOOD SPF:836  
FLOOD SPF: 360  
DESIGN: 596

### STA5 DISCHARGE CANAL FLOWS

NO FLOOD SPF:2510  
FLOOD SPF:1080  
DESIGN:1790

G406 BY-PASS  
FLOWS  
NO FLOOD SPF:1768  
FLOOD SPF: 2720  
DESIGN: 904

G406

USSC  
UNIT 2 FLOWS  
NO FLOOD SPF:300  
FLOOD SPF: 300  
DESIGN:300

L-3 CANAL

MAIN CANAL

### STA6-2 FLOWS

NO FLOOD SPF:1060  
FLOOD SPF: 700  
DESIGN:667

### STA6 DISCHARGE CANAL FLOWS

NO FLOOD SPF:1682  
FLOOD SPF: 1112  
DESIGN:1058

USSC  
C139 ANNEX FLOWS  
NO FLOOD SPF:452  
FLOOD SPF: 452  
DESIGN:452

F.P. & L. EASEMENT

STA6-5 FLOWS  
NO FLOOD SPF:454  
FLOOD SPF: 301  
DESIGN:286

STA6-3 FLOWS  
NO FLOOD SPF:168  
FLOOD SPF: 111  
DESIGN:105

G407A BY-PASS  
FLOWS  
NO FLOOD SPF:0  
FLOOD SPF:2000  
DESIGN:0

G407A

G404 FLOWS  
SPF: 570  
DESIGN:285

FLOW TO WCA3  
NO FLOOD SPF:2252  
FLOOD SPF: 3682  
DESIGN:1343

ALL FLOWS REPORTED IN CUBIC FEET PER SECOND  
FLOOD REFERS TO CONDITION ON MIAMI CANAL

SFWMD

**URS**  
Boca Raton, Florida

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FLOW SCHEMATIC  
INITIAL CONFIGURATION

PROJ NO  
38615215

FIG NO  
5



C139 FLOWS

SPF: 3440  
DESIGN: 2096

L-2 CANAL

STA5-1 FLOWS

NO FLOOD SPF: 500  
FLOOD SPF: 360  
DESIGN: 381

STA5-2 FLOWS

NO FLOOD SPF: 500  
FLOOD SPF: 360  
DESIGN: 381

STA5-3 FLOWS

NO FLOOD SPF: 500  
FLOOD SPF: 360  
DESIGN: 381

STA5-4 FLOWS

NO FLOOD SPF: 665  
FLOOD SPF: 781  
DESIGN: 390

STA5-5 FLOWS

NO FLOOD SPF: 835  
FLOOD SPF: 981  
DESIGN: 490

STA5 DISCHARGE CANAL  
FLOWS

NO FLOOD SPF: 1500  
FLOOD SPF: 1080  
DESIGN: 1143

G406 BY-PASS  
FLOWS

NO FLOOD SPF: 2440  
FLOOD SPF: 2720  
DESIGN: 1334

G407B BY-PASS FLOWS

NO FLOOD SPF: 0  
FLOOD SPF: 0  
DESIGN: 0

USSC  
C139 ANNEX FLOWS

NO FLOOD SPF: 452  
FLOOD SPF: 452  
DESIGN: 452

STA6-2&4 FLOWS

NO FLOOD SPF: 605  
FLOOD SPF: 712  
DESIGN: 355

STA6 DISCHARGE  
CANAL FLOWS

NO FLOOD SPF: 2392  
FLOOD SPF: 2812  
DESIGN: 1405

F.P. & L. EASEMENT

STA6-5 FLOWS  
NO FLOOD SPF: 209  
FLOOD SPF: 246  
DESIGN: 124

DISCHARGE  
PUMP STATION

NO FLOOD SPF: 2392  
FLOOD SPF: 2812  
DESIGN: 1405

STA6-3 FLOWS  
NO FLOOD SPF: 78  
FLOOD SPF: 92  
DESIGN: 46

G407A BY-PASS  
FLOWS  
SPF: 0  
DESIGN: 0

G404 FLOWS

SPF: 570  
DESIGN: 285

FLOW TO WCA3

NO FLOOD SPF: 2962  
FLOOD SPF: 3382  
DESIGN: 1690

ALL FLOWS REPORTED IN CUBIC FEET PER SECOND  
FLOOD REFERS TO CONDITION ON MIAMI CANAL

SFWMD

**URS**  
Boca Raton, Florida

SCALE:  
N.T.S.

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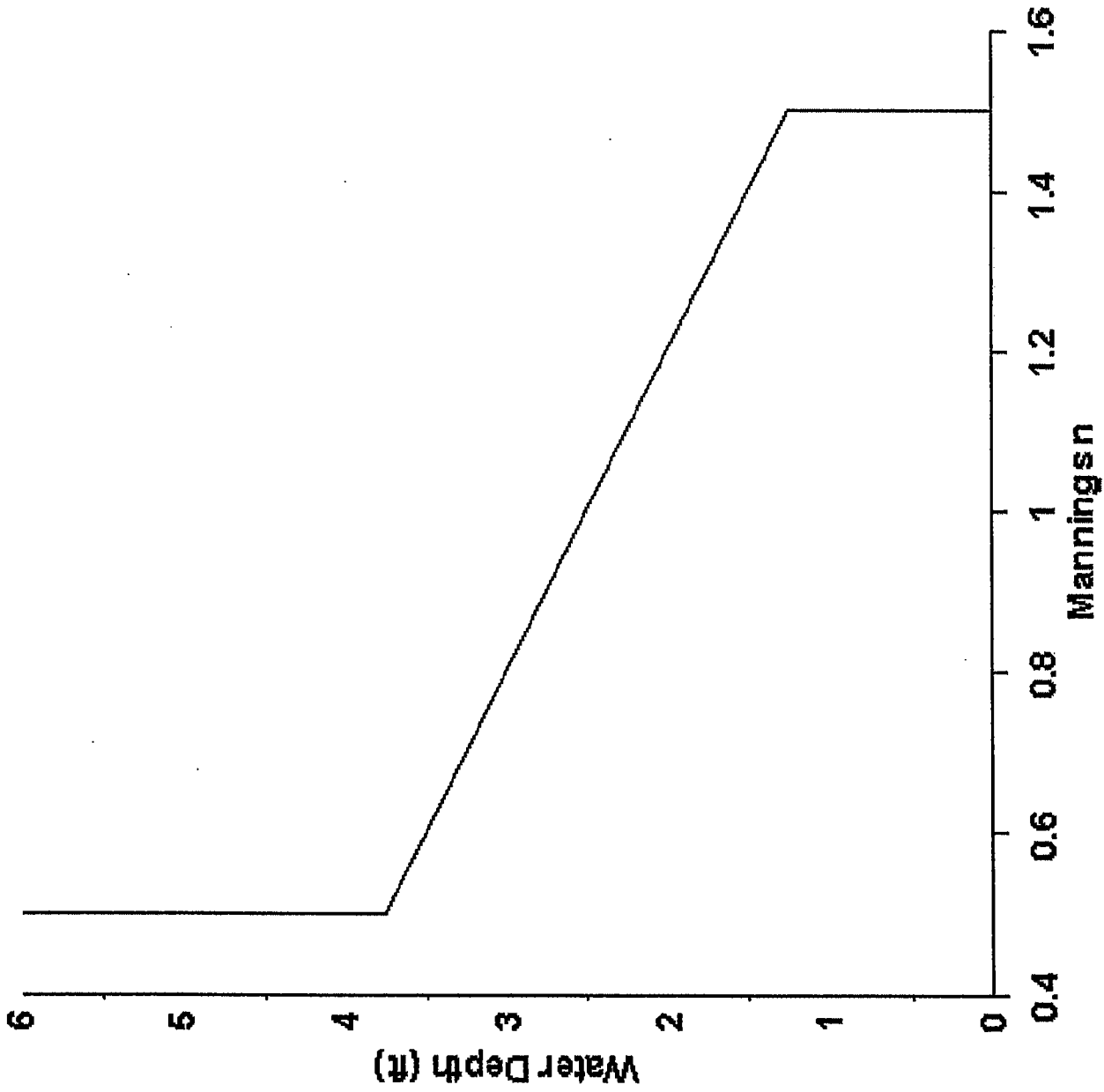
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FLOW SCHEMATIC  
BUILDOUT  
CONFIGURATION

PROJ NO  
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FIG NO

6



SFWMD  
COMPARTMENT C

**URS**

Boca Raton, Florida

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MANNGINS N PROFILE

PROJ NO  
38615215

FIG NO  
7



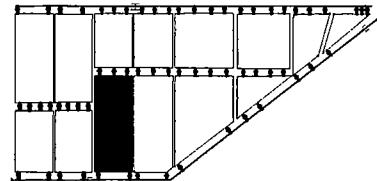
N

collection ditch

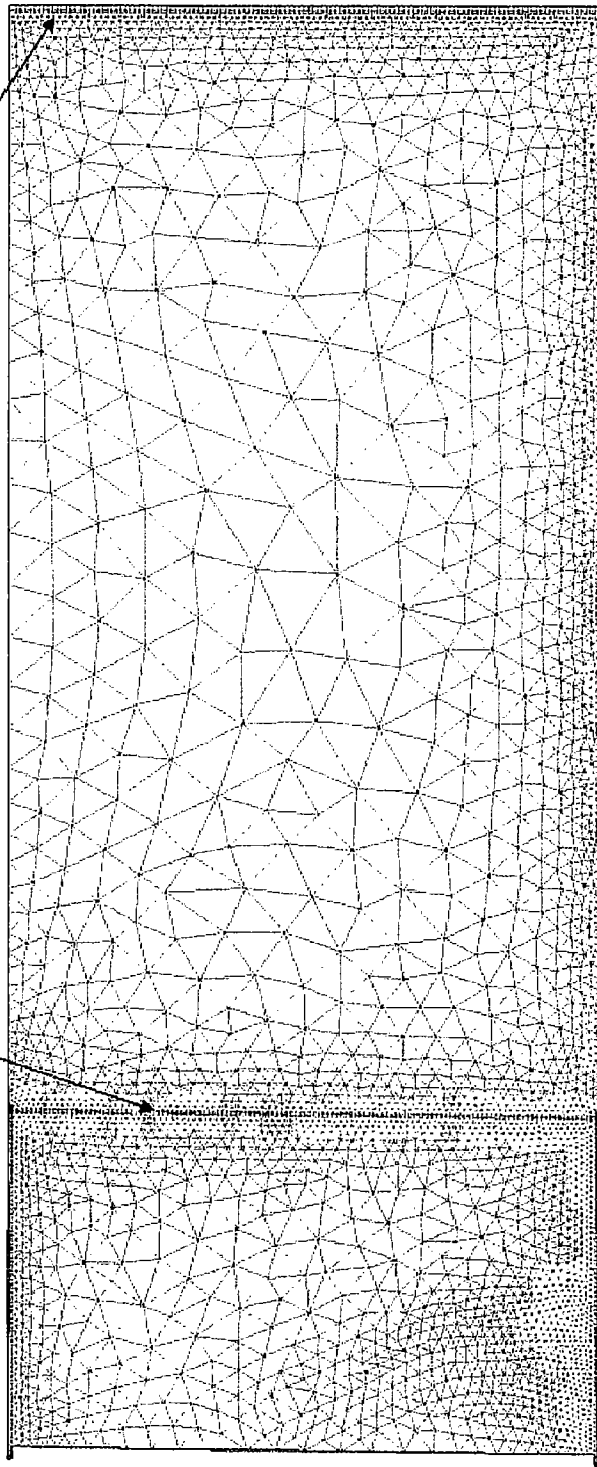
Feeder canal

borrow pits

L-3 canal



KEY PLAN



PROJ NO  
38615215

FIG NO  
8

STA-5 FLOW WAY 3A  
MODEL MESH



Boca Raton, Florida

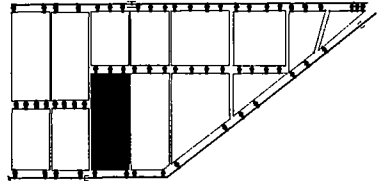
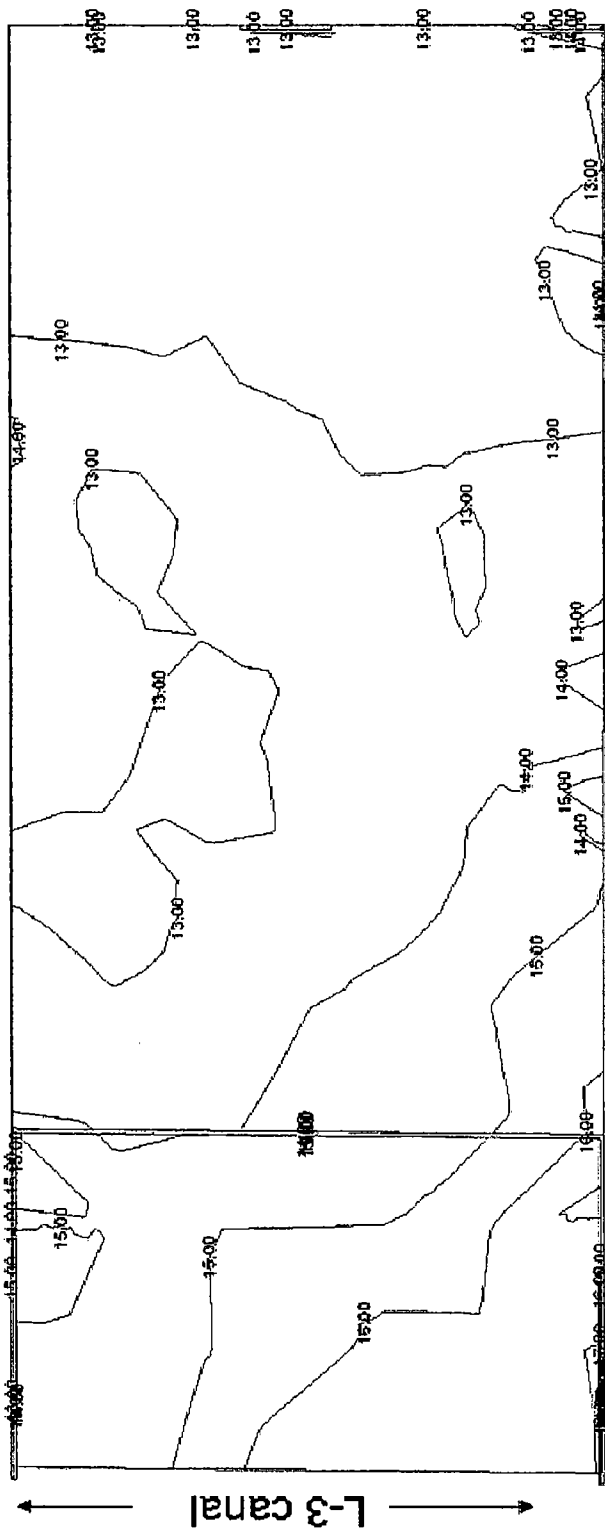
DRAWN BY: JC  
CHECKED BY: CV

DATE: 03/14/05

SCALE:  
N.T.S.

C:\38615215\STA-5 FLOW WAY 3A\STATIONING\STATIONING.DWG 3/12/2005 6:27:58 PM EST

SFWMD



KEY PLAN

PROJ NO  
38615215

FIG NO  
9

STA-5 FLOW WAY 3A  
MODEL TOPOGRAPHY

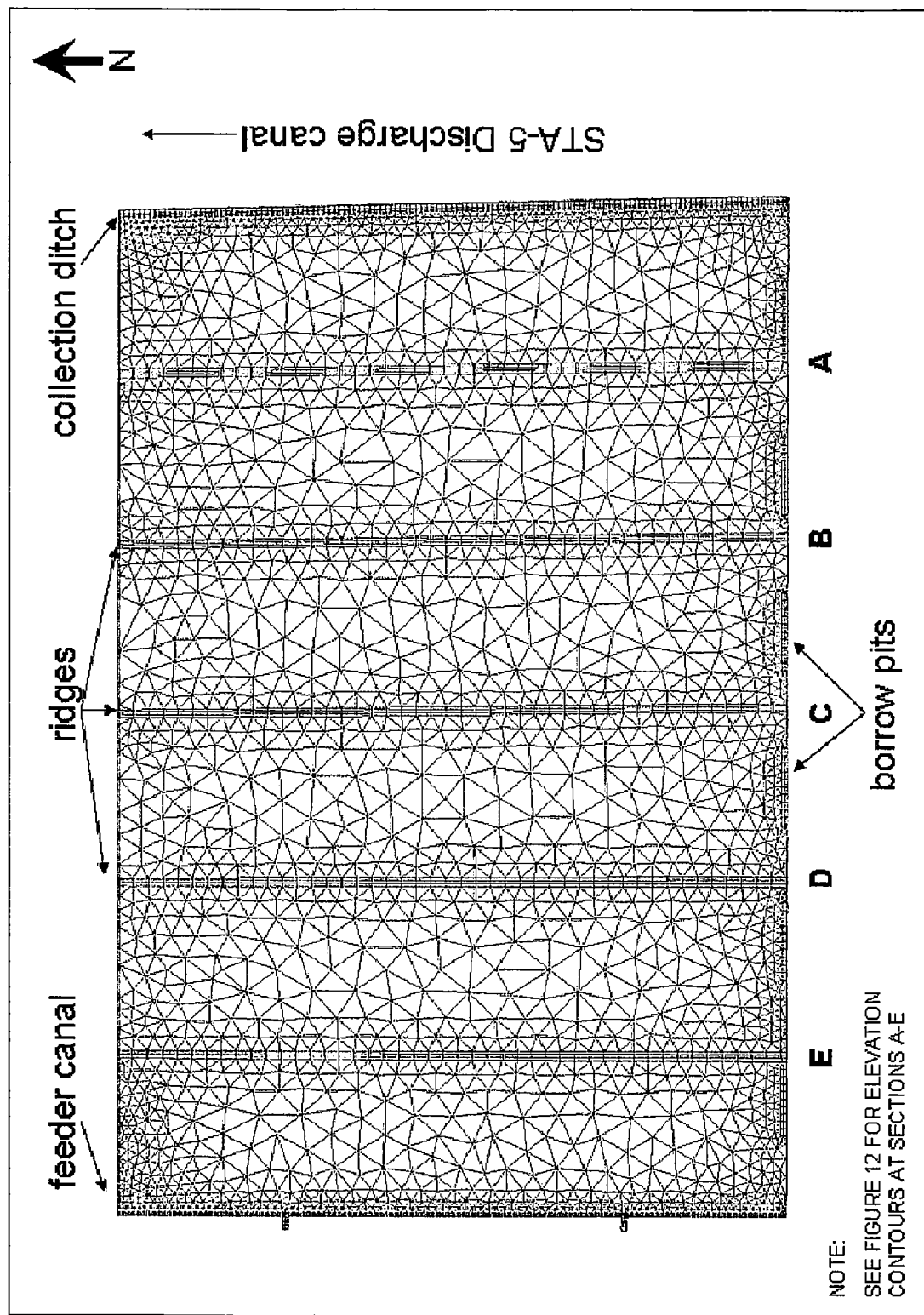
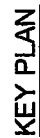


Boca Raton, Florida

SCALE: N.T.S.	DRAWN BY: JC	DATE: 03/14/05
	CHECKED BY: CV	

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SFWMD



**NOTE:**

SEE FIGURE 12 FOR ELEVATION  
CONTOURS AT SECTIONS A-E

**SFWMD**

**URS**

Boca Raton, Florida

DRAWN BY: JC

DATE: 03/14/05

G:\2863\616216 SP\WMD\CAD\PRESENTATION\tdm\LT4-010.dwg	DATE: 03/14/05
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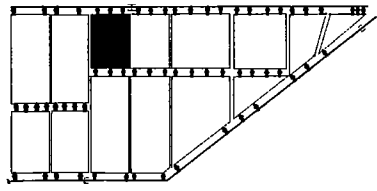
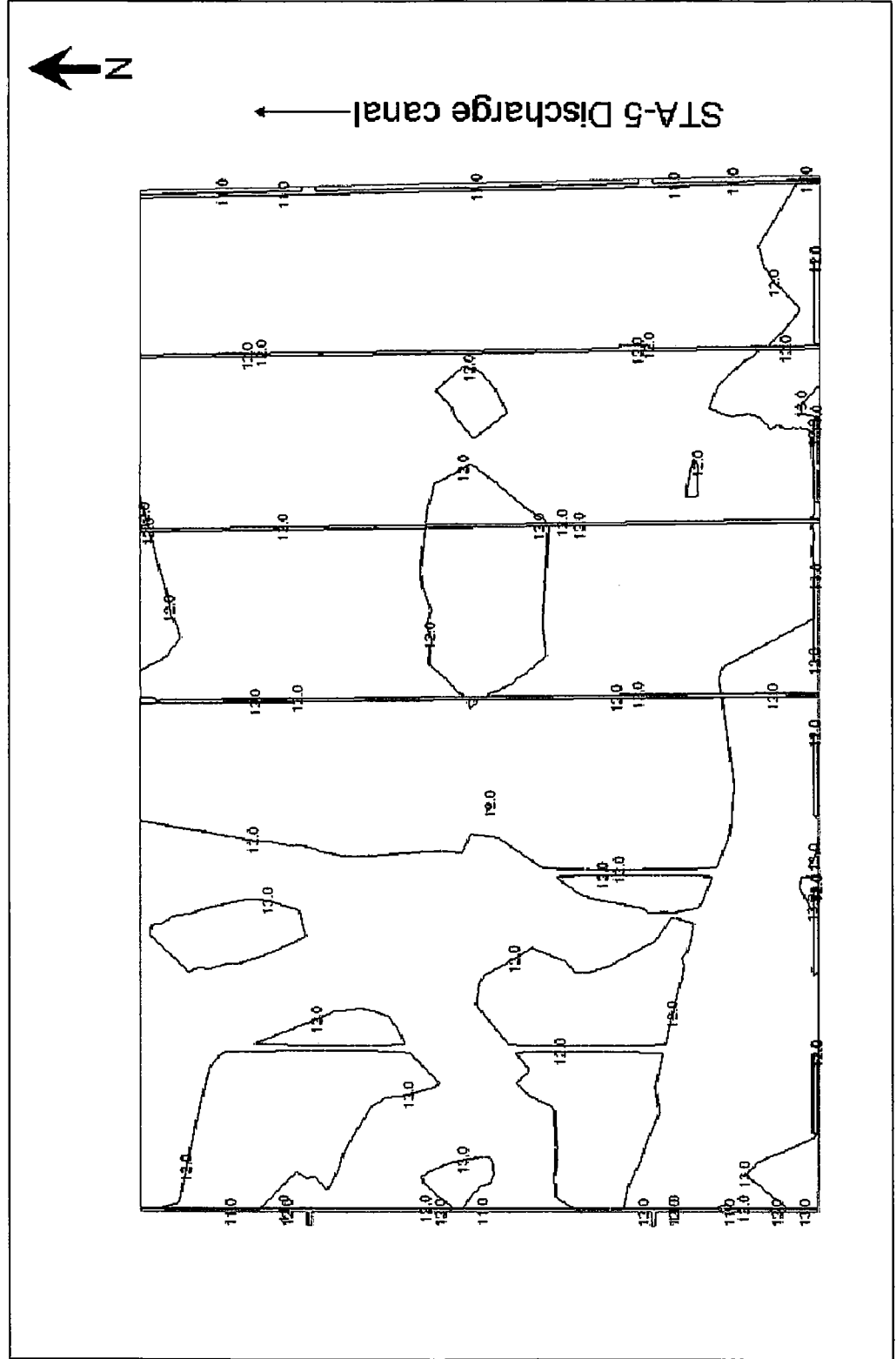
N.T.S.

3/12/2005 6:28:31 PM EST

**STA-5 FLOW WAY 3B  
MODEL MESH**

**PROJ NO**  
**38615215**

FIG NO 10



KEY PLAN

PROJ NO  
38615215

FIG NO  
11

STA-5 FLOW WAY 3B  
MODEL TOPOGRAPHY

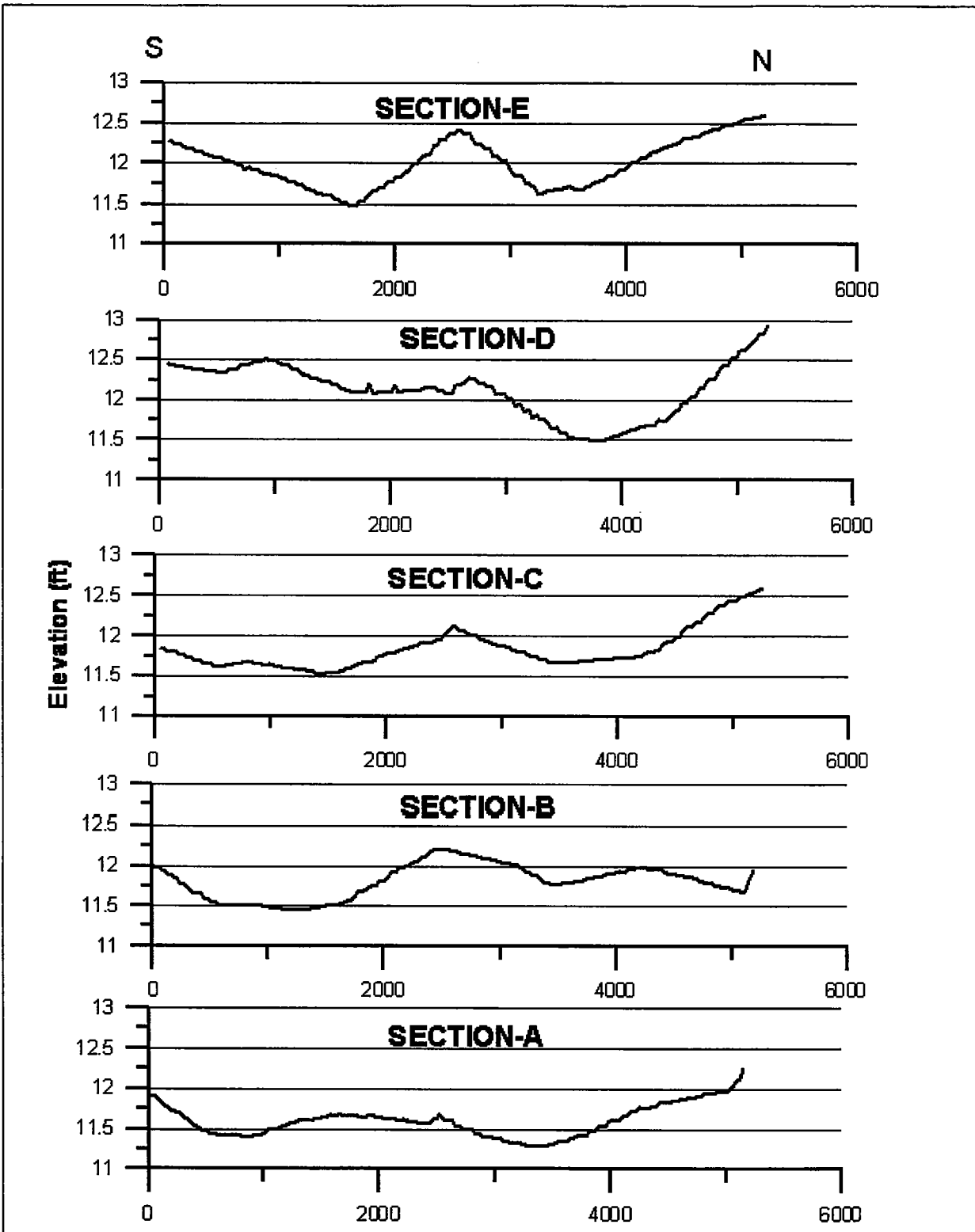


Boise, Idaho, Florida

SCALE: N.T.S.	DRAWN BY: JC	CHECKED BY: CV	DATE: 03/14/05
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SFWMD



**SFWMD**

**URS**  
Boca Raton, Florida

SCALE:  
N.T.S.

DRAWN BY: MV  
CHECKED BY: CV

DATE: 03/10/05

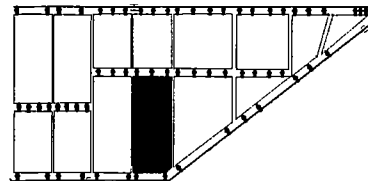
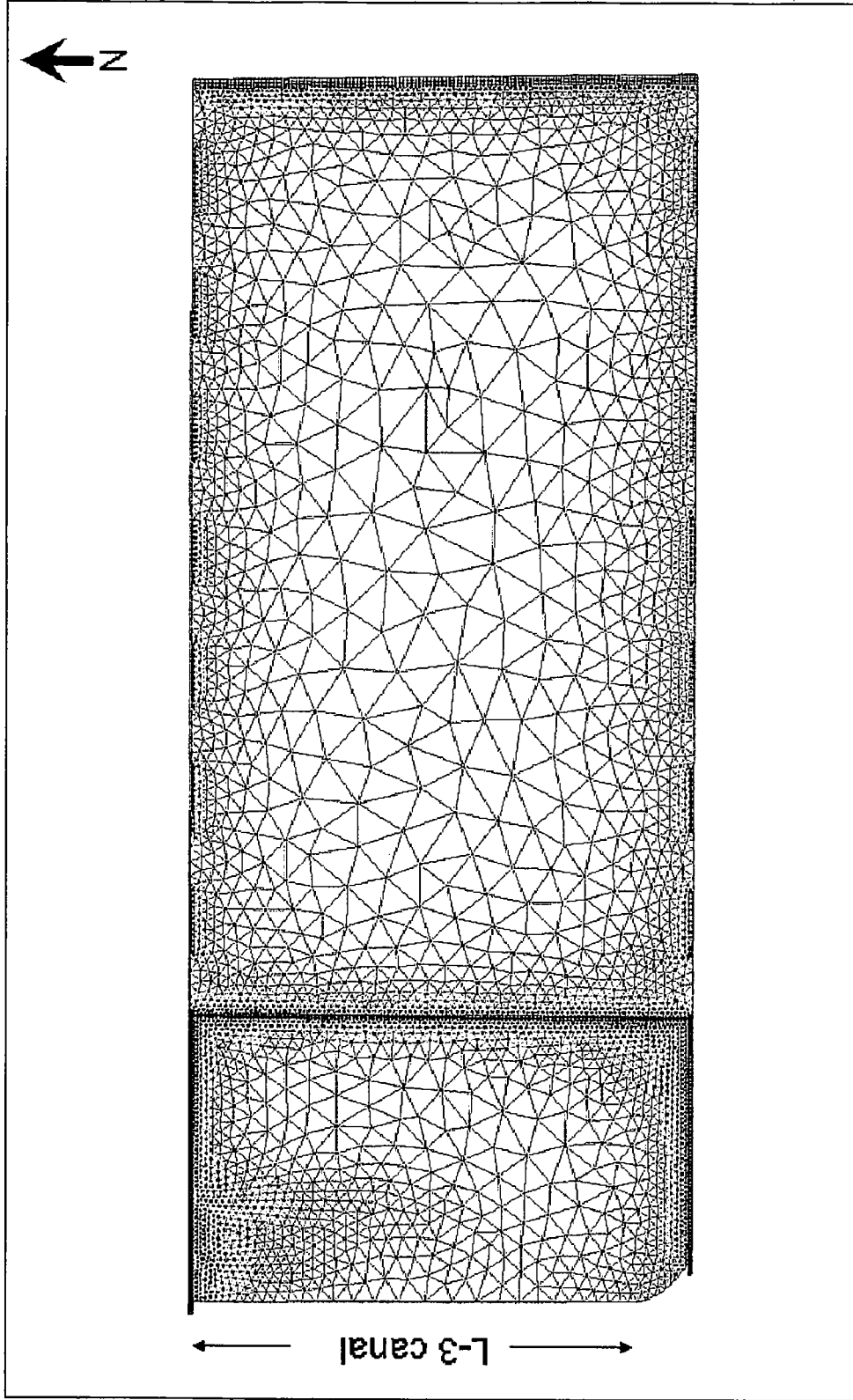
G:\296138615215 SFWMD\CADD\PRESENTATION\plot\MULLINTM-012.dwg 3/12/2005 6:30:43 PM EST

DISTANCE SOUTH TO NORTH  
STA-5 FLOW WAY 3B

PROJ NO  
38615215

FIG NO

12



KEY PLAN

SFWMD



Boca Raton, Florida

DRAWN BY: JC

CHECKED BY: CV

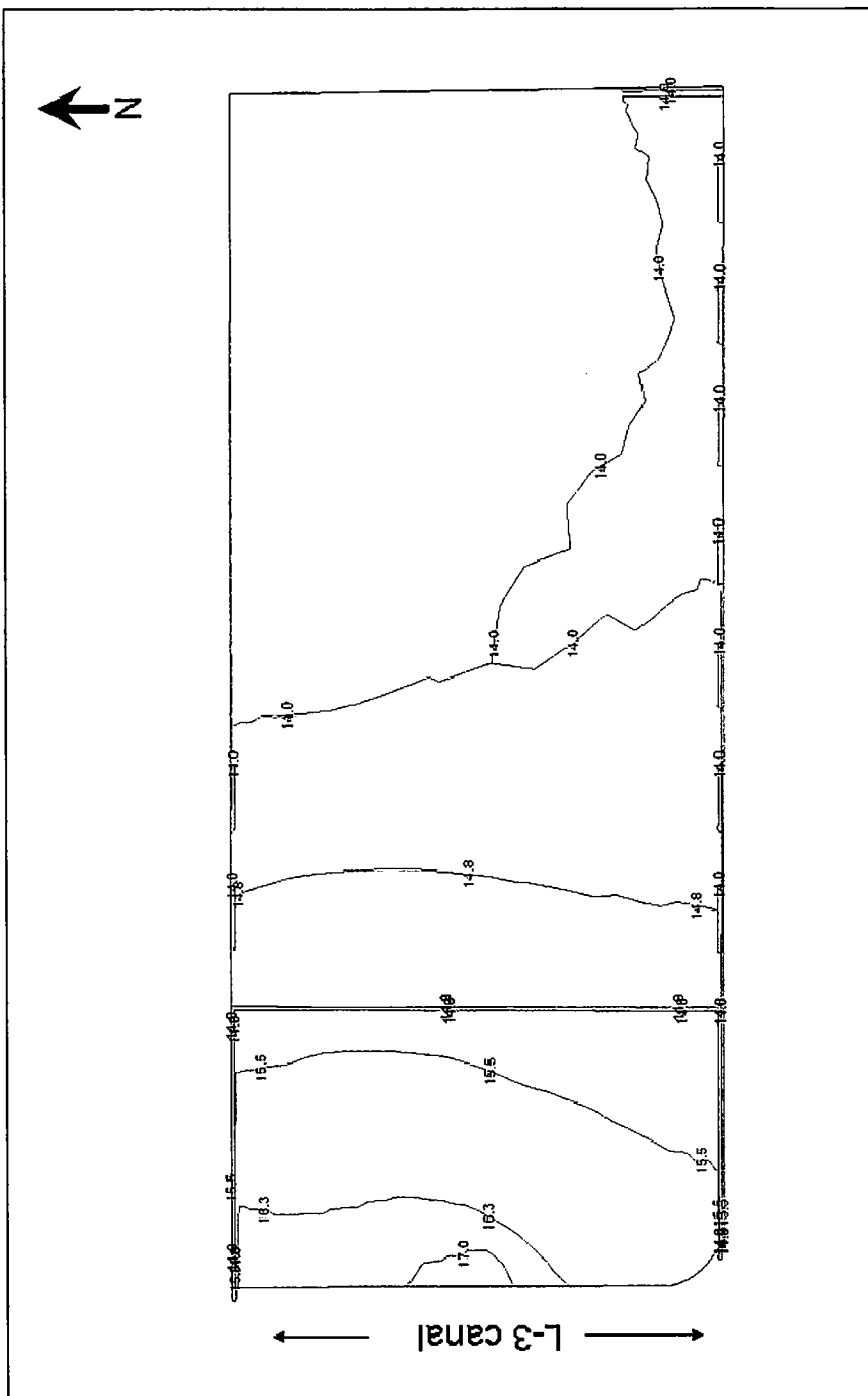
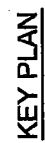
DATE: 03/14/05

C:\38615215\SF\WMD\ADD\PRESENTATION\PTM\TITLE413.dwg 3/12/2005 5:31:48 PM EST

STA-5 FLOW WAY 4A  
MODEL MESH

PROJ NO  
38615215

FIG NO  
13



**SFWMD**

**URS**  
Boca Raton, Florida

**Boca Raton, Florida**

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DRAWN BY: JC

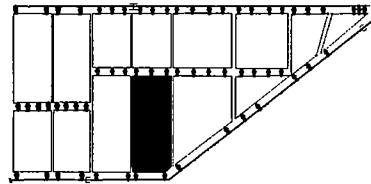
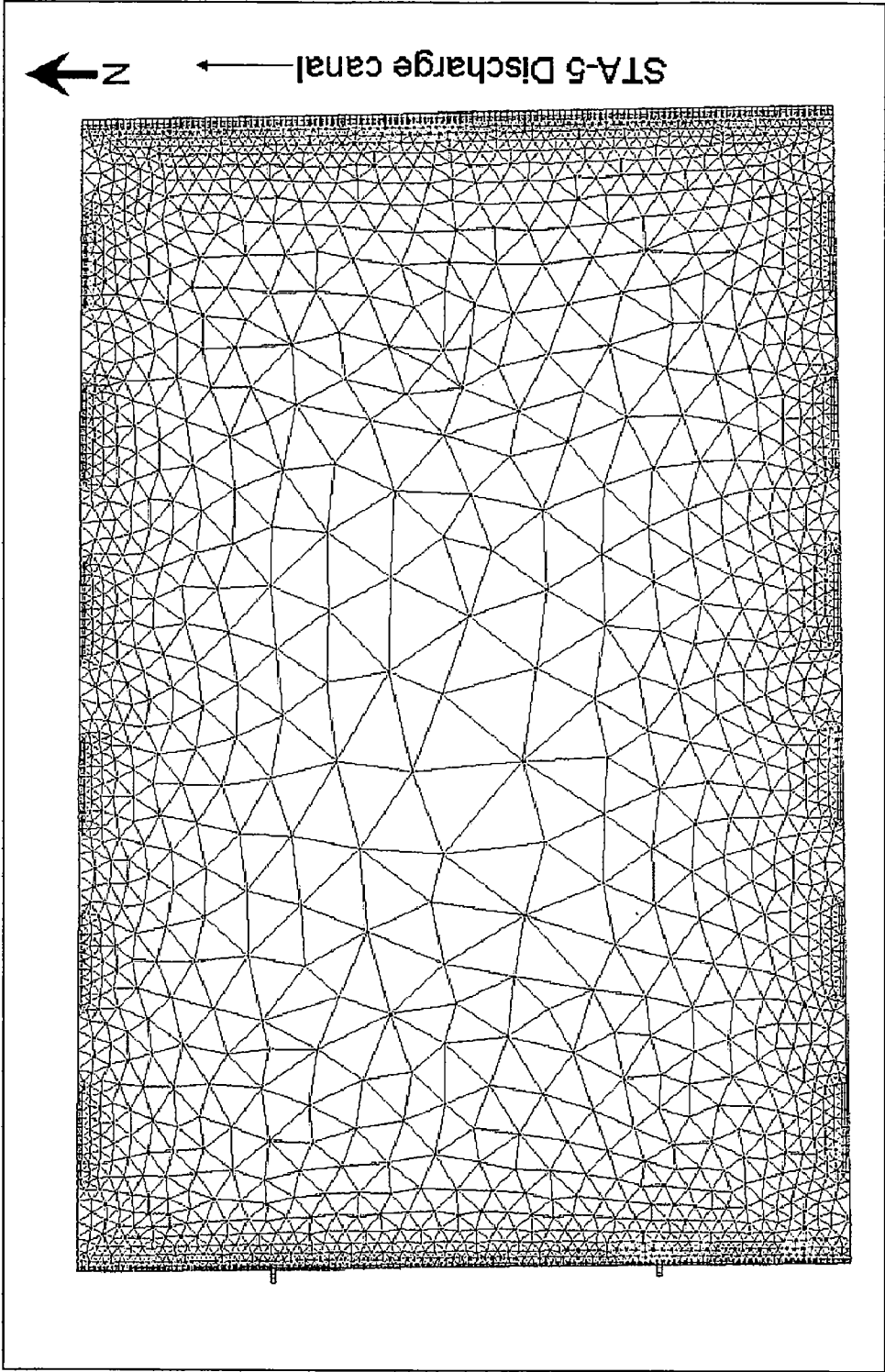
**06/19/2017**

3/12/2005 8:32:33 PM EST

PROJ NO  
38615215

FIG NO  
14

**STA-5 FLOW WAY 4A  
MODEL TOPOGRAPHY**



KEY PLAN

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**URS**

Boca Raton, Florida

SCALE: N.T.S.

DRAWN BY: JC

CHECKED BY: CV

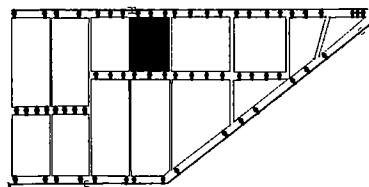
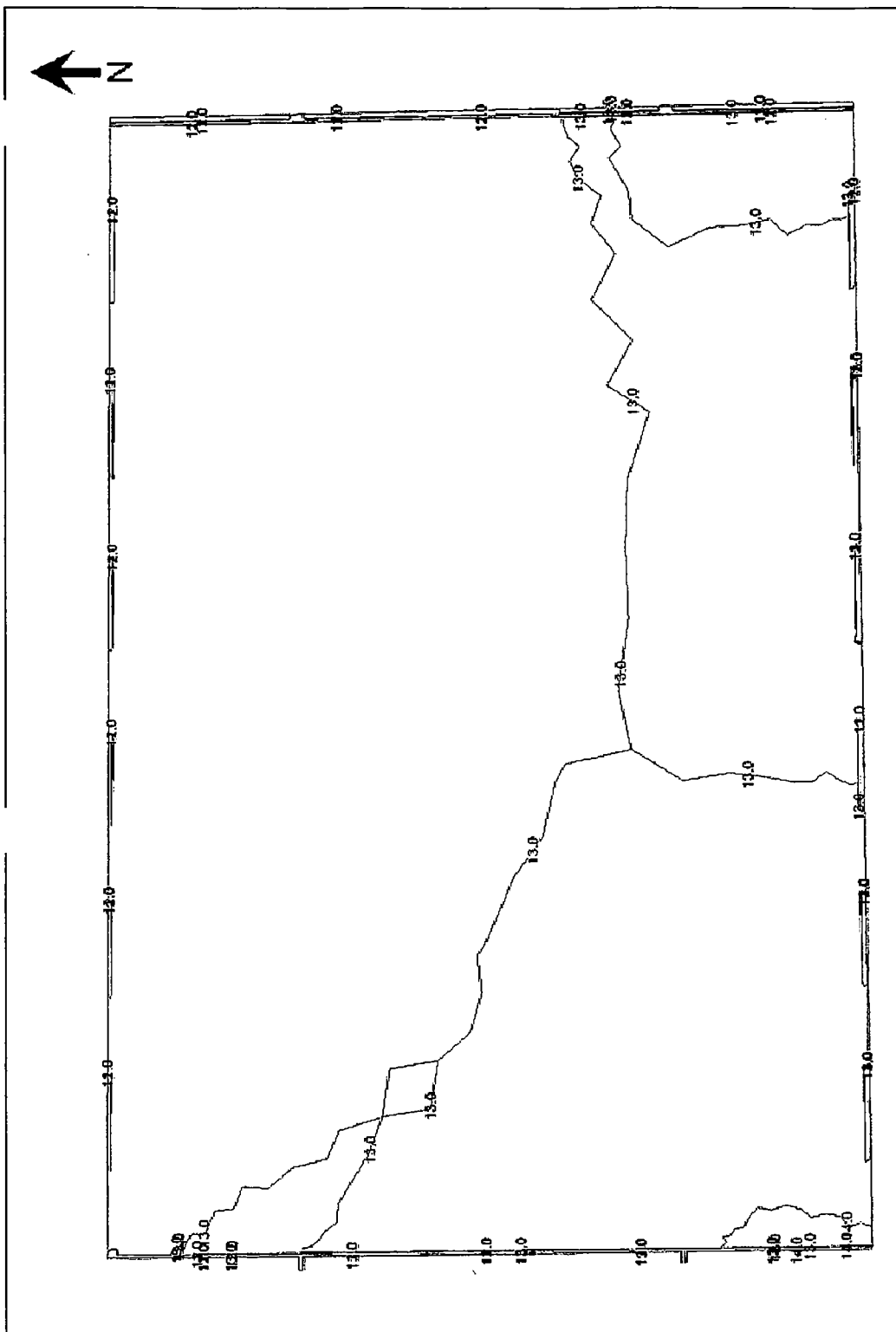
DATE: 03/14/05

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STA-5 FLOW WAY 4B  
MODEL MESH

PROJ NO  
38615215

FIG NO  
15



## KEY PLAN

**SFWMD**

**URS**

Boca Raton, Florida

SCALE:	DRAWN BY: JC	DATE: 03/14/05
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DRAWN BY: JC

DATE: 02/14/05

DATE: 02/14/05

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# STA-5 FLOW WAY 4B MODEL TOPOGRAPHY

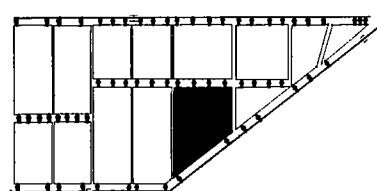
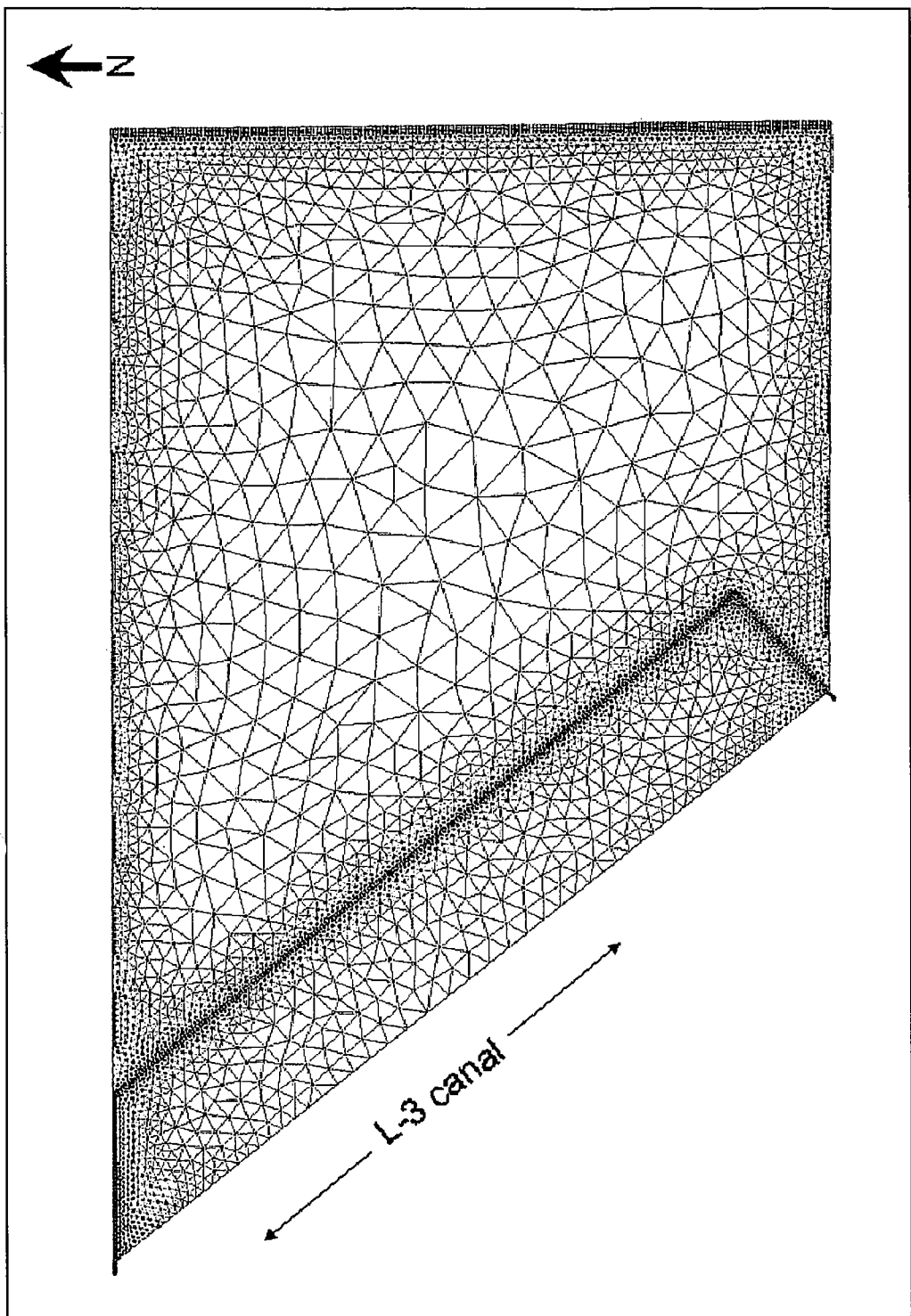
## MODEL TOPOGRAPHY

PROJ NO  
38615215

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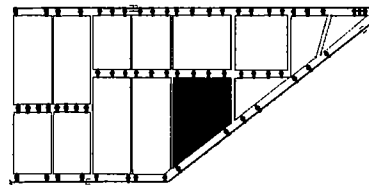
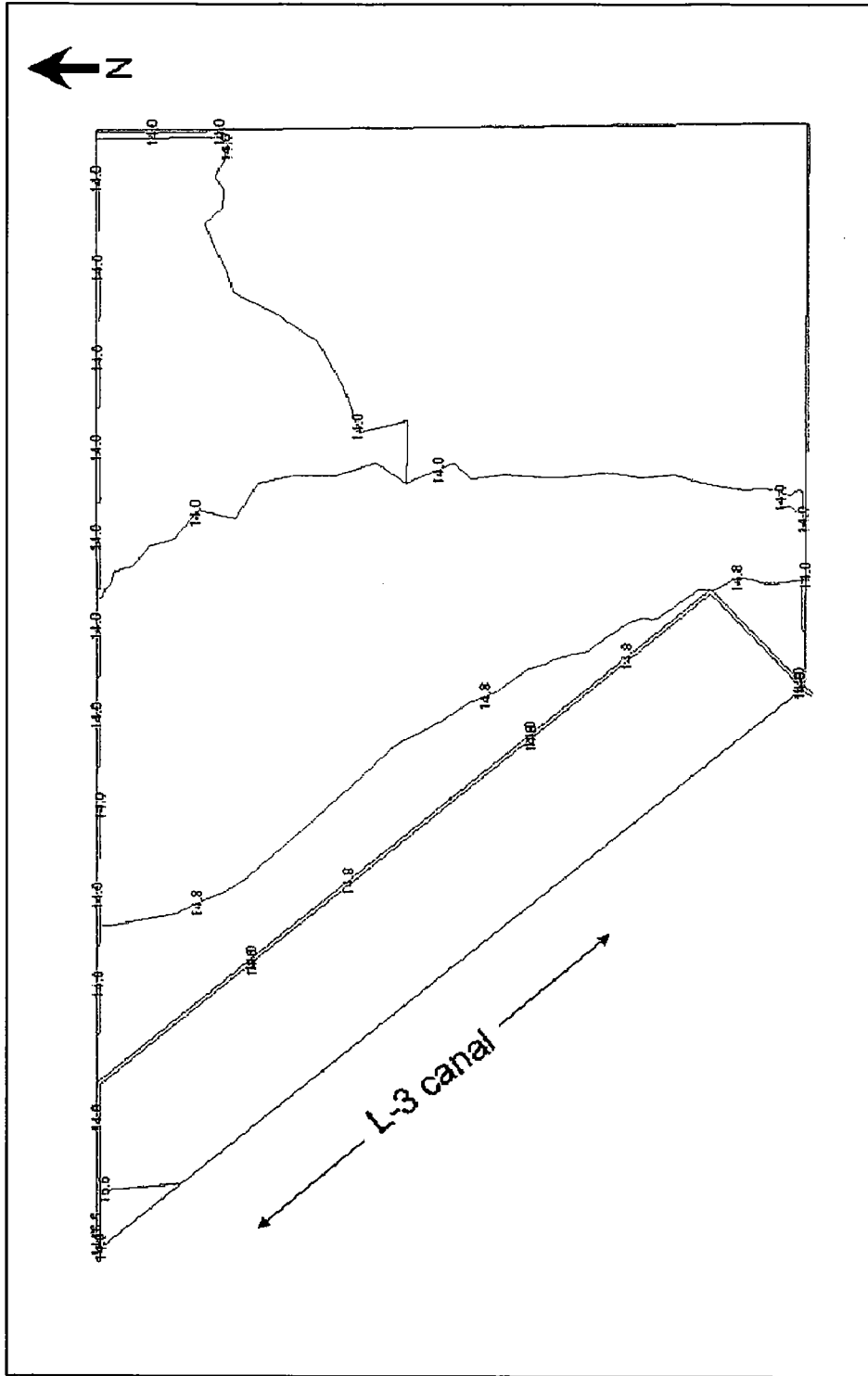
FIG NO

16



KEY PLAN

SFWMD	<div>URS</div> <div>Boca Raton, Florida</div>	STA-5 FLOW WAY 5A		
		MODEL MESH		
		SCALE: N.T.S.	DRAWN BY: JC CHECKED BY: CV	DATE: 03/14/05
		G:\38615215 SFWMD\CADD\PRESENTATION\BATTM\UNITM-017.dwg 3/12/2005 8:24:38 PM EST		
PROJ NO 38615215		FIG NO 17		



**SFWMD**

**URS**

**Boca Raton, Florida**

**SCALE:**

N.T.S.

DRAWN BY: JC

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DATE: 03/14/05

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**PROJ NO**  
**38615215**

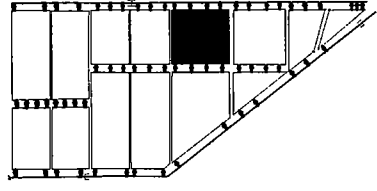
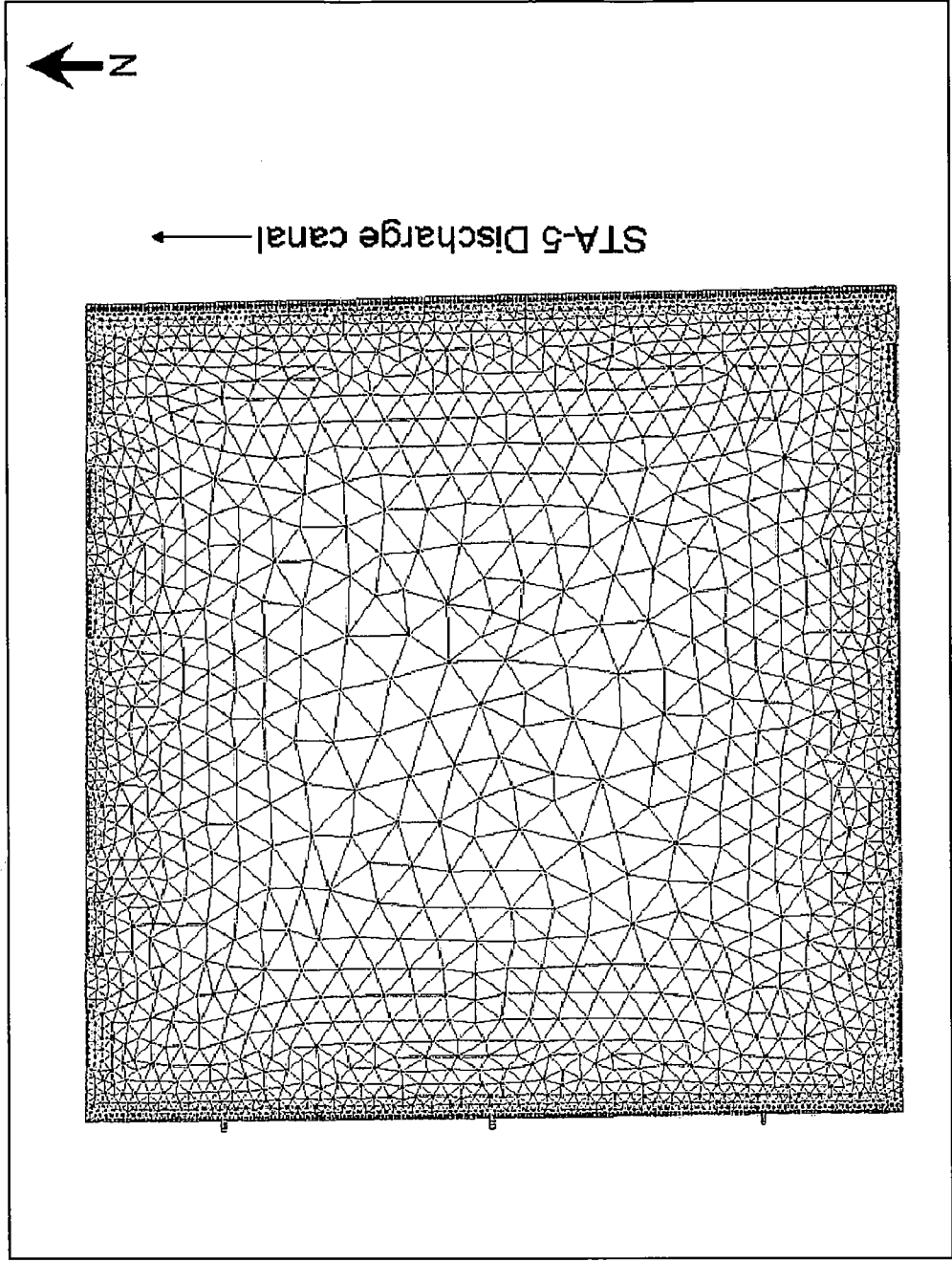
38615215

FIG NO

18

**STA-5 FLOW WAY 5A  
MODEL TOPOGRAPHY**

## MODEL TOPOGRAPHY



KEY PLAN

SFWMD

**URS**

Boca Raton, Florida

SCALE:  
N.T.S.

DRAWN BY: JC  
CHECKED BY: CV

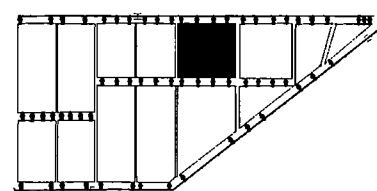
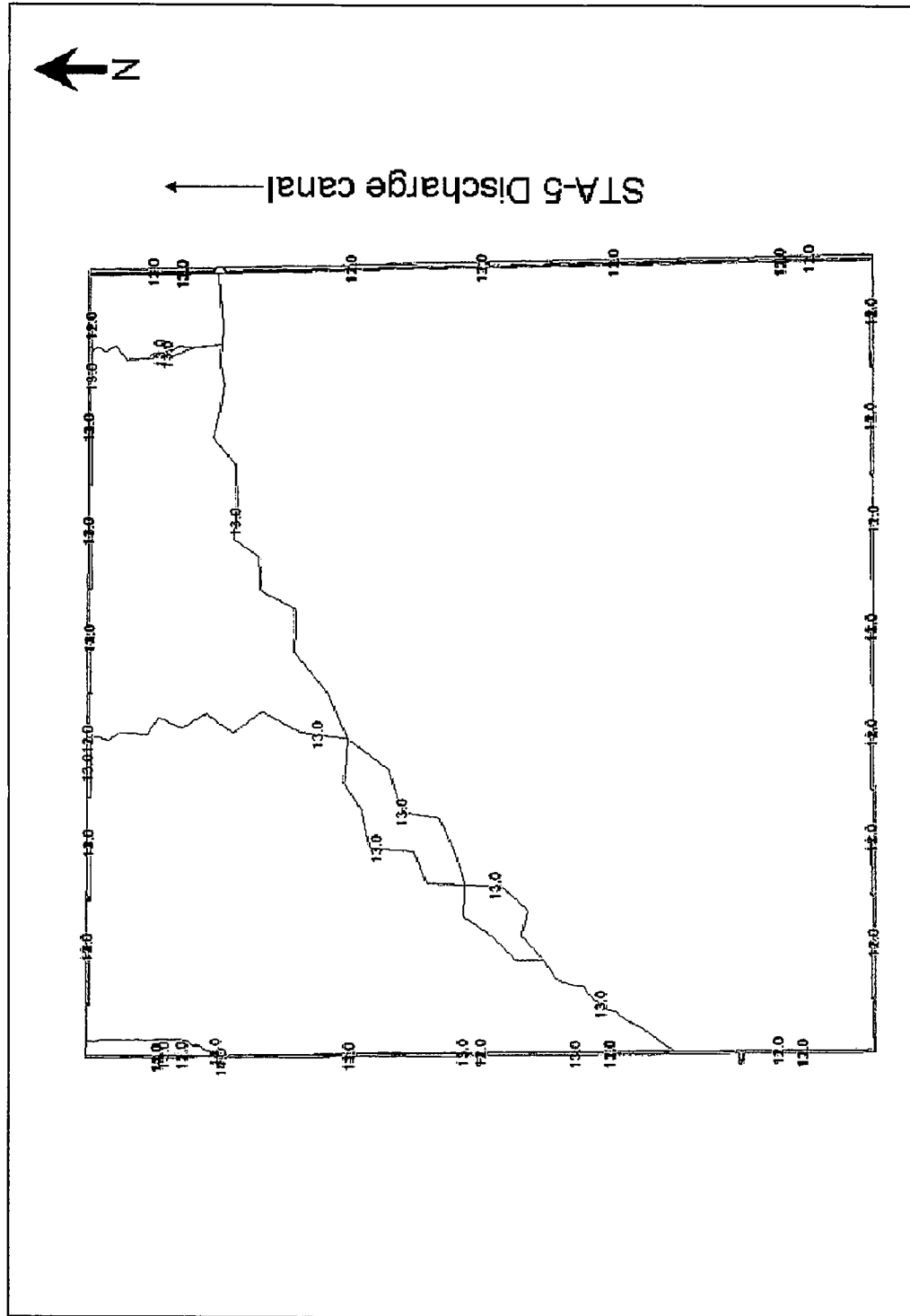
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STA-5 FLOW WAY 5B  
MODEL MESH

PROJ NO  
38615215

FIG NO  
19



KEY PLAN

PROJ NO  
38615215

FIG NO  
20

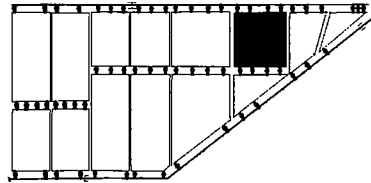
STA-5 FLOW WAY 5B  
MODEL TOPOGRAPHY



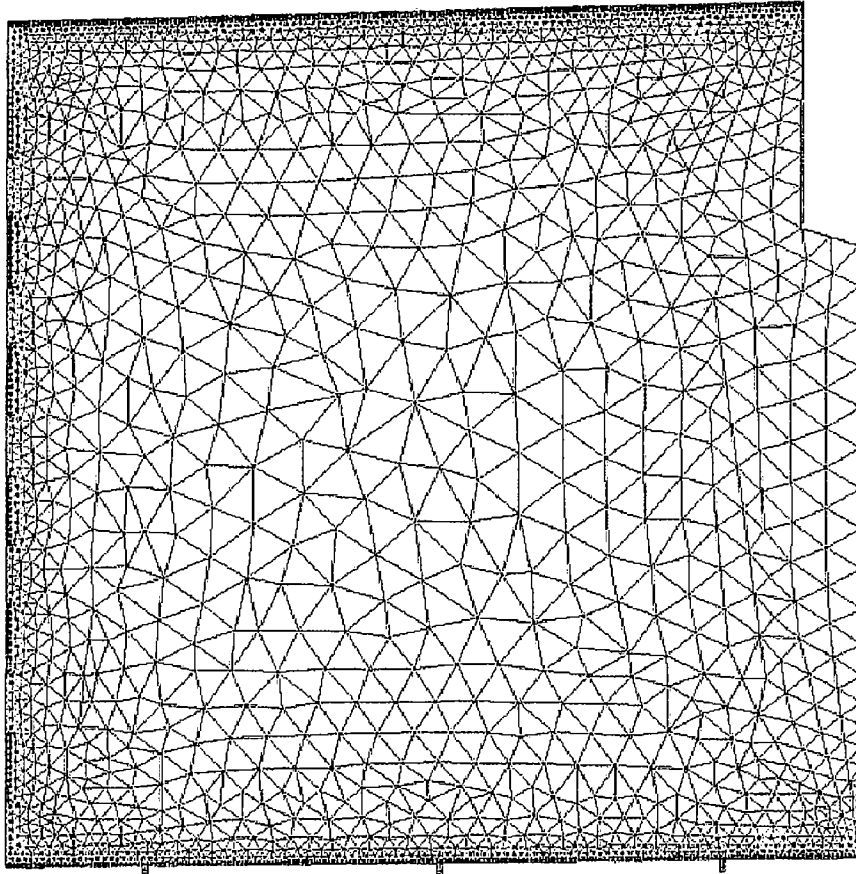
Bozai Raton, Florida

SCALE: N.T.S.  
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DATE: 03/14/05  
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SFWMD



KEY PLAN



STA-6 Discharge canal



SFWMD

**URS**

Boca Raton, Florida

DRAWN BY: JC

CHECKED BY: CV

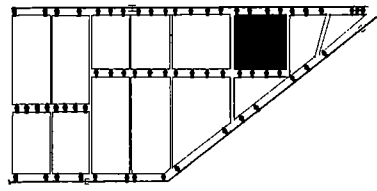
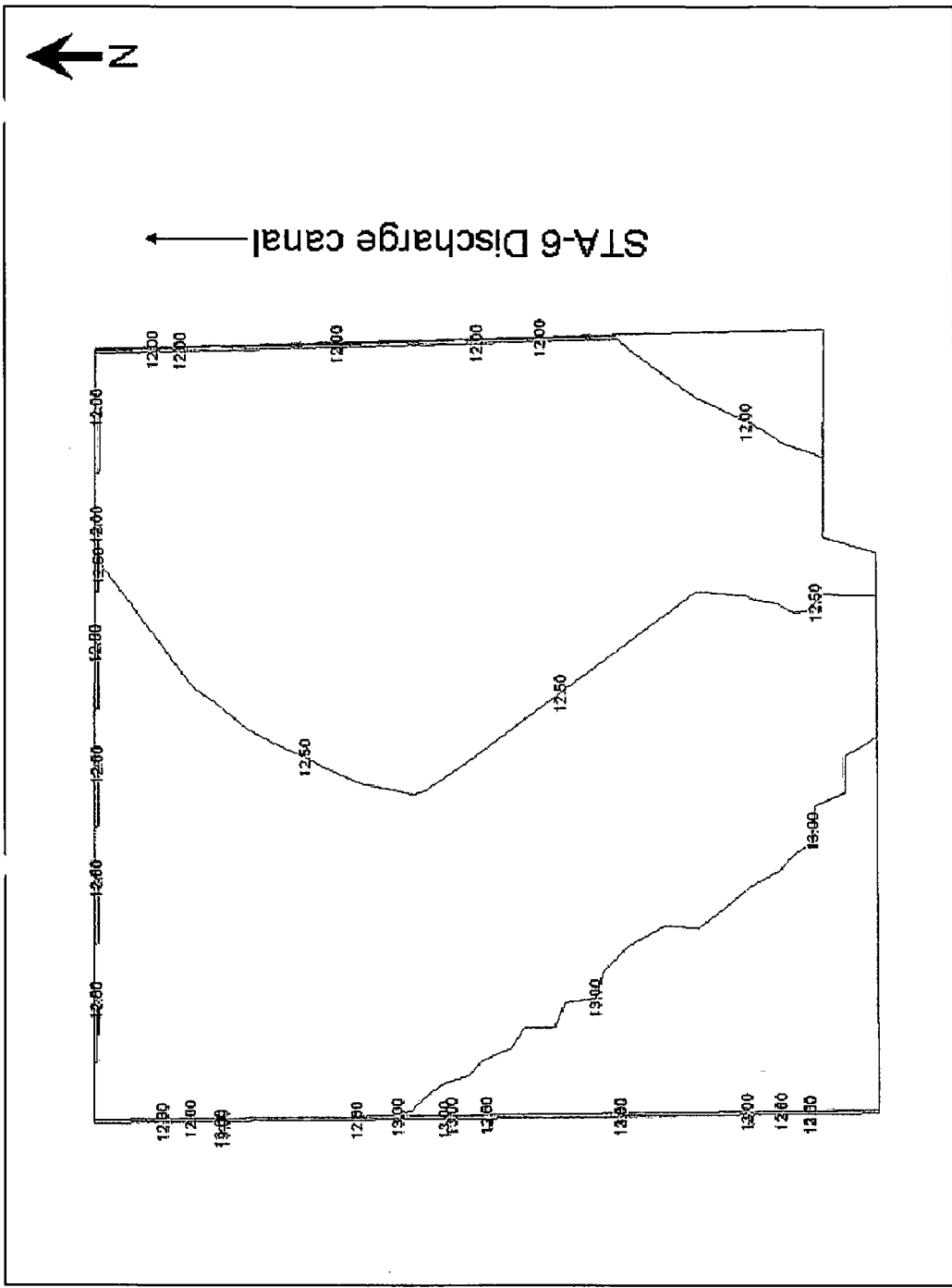
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STA-6 SECTION 2  
MODEL MESH

PROJ NO  
38615215

FIG NO  
21



KEY PLAN

PROJ NO  
38615215

FIG NO  
22

STA-6 SECTION 2  
MODEL TOPOGRAPHY



Boca Raton, Florida

SCALE: N.T.S. DRAWN BY: JC DATE: 03/14/05  
CHECKED BY: CV

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